



tarkan  
the cantar mirror

software v 2.14

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# Aaton Cantar-X1&2

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## Cantar / Internet

### User Manual and Software download

Cantar, Majax and R.can-w manuals and tutorials are on <http://www.soft.aaton.com/swcantar/> Latest Cantar software is accessible to registered owners only; beta versions are NOT to be used for commercial assignments.

- on your **first visit**: click 'create an account', enter your details, don't forget the country. After a few seconds you will receive an email with your password. Enter this password and your email address in the login page.
- on your **next visits**: If you forgot your password, click 'lost password'. Enter your email address; if it is found in the Cantar database, the password is sent to this address.

### Software versions

**v2.14** (Mar. 2008) – Direct routing of all inputs to T7T8, e.g. Mic5.Xb. – On-the-fly T7T8 in-grid control. – One hand Solo/Filter adjust. – Latency protection of the limiter actuators. – Auto-recall of the project's sound-report headers. + Tarkan control through Ethernet.

**v2.11** (Jan. 2008) – Creation of 'play-cards' with cue in/out for selective play of current and archive 'play-files'. + Rec&Play can play up to eight tracks from internal or external HDD, add nine analog inputs while recording eight tracks on the internal HDD. + Remix of a prior recording with new dynamic mixdown and addition of a commentary track. + ADR for 'hear it/say it' sessions. + Incremental Re-Recording.

**v2.06** (Dec. 2007) – Talkback Mic sent to Line-out and/or Foldback left (e.g. boom) or right (e.g. director). – Double beep at REC stop. – Two PDF Sound-Reports (ALL for 't p w a n' takes & WILD for 'w' takes). – ALE and CSV lists added to backups. + Up to 85ms delay on analog inputs; differential alignment and TC compensation.

### From Cantar-X1 to X2

X2 brings the following hardware improvements :

- a CM-5 motherboard carrying an FPGA (Field Programmable Gate Array) which provides increased processing power for functions which can't be performed by X1,
- an analog-to-digital converter (AD-5) with nine programmable audio delay buffers (up to 85ms @ 48kHz),
- a 100BaseT Ethernet interface board (ET-1) with an RJ45 socket in a hinged HDD holder.

### Cantar Users' Group

You can exchange tips with other cantarists on <http://blake.aaton.com/mailman/listinfo/cantar-users>

### Pictures on the road

Send your pictures to [aaton-support@aaton.com](mailto:aaton-support@aaton.com) for the Cantar gallery, we will put the best ones on <http://www.aaton.com/gallery/on-location>

### Post Production helper

Read the 'CantarPostChain' and spread it around to Post. <http://www.aaton.com/files/cantar-post-chain-22.pdf>

'-' X1 & X2 '+' X2 only

- + Wordclock-sync at 48/96kHz ( $\pm 0.1\%$ ) and 44.1kHz.
- + Autoslate detection on Mic1-5, Line-in1-4 and Track1-8.

**v1.87/v2.00** (June 2007) – 'Remote Roll' recording starts upon receiving running LTC, and stops upon receiving frozen LTC from camera or GMT-u (no TC overlaps, no record interruption on RF transmission drop-outs). – Remote STOP, TEST, PPR and REC from CantaRem, R.can-w or keyboard. – Line-out & Foldback levels can be controlled by CantaRem sliders. – A new ALE/PDF page opens on each header item change. – Blank columns are allowed in the PDF Sound-Report. – In 'Forced' mode, CantaRem can put Cantar on STOP. – Archive tags are ticked after Backup@Call, they allow Cantar to finish filling a half full DVD-RAM. – IdleCopy is less prone to bus hangs with slow external HDDs (see LaCie firmware update p.41). – CSV file stored on internal HDD speeds-up PDF burning to DVD-RAM.

**note: in a Cantar-X1, v1.78 must have been installed once as the key to current versions.**

X1 and X2 both work under Aaton-OS in the same low power consuming CPU, with the same software versions but some features require the capabilities of X2 to operate, e.g., Rec&Play; DVD-RAM playback; Ethernet connectivity; Differential delays on Mic & Line-in; AutoSlate detection on Mic, Line-in and Track; Wordclock sampling and synchronizing of multiple Cantars.

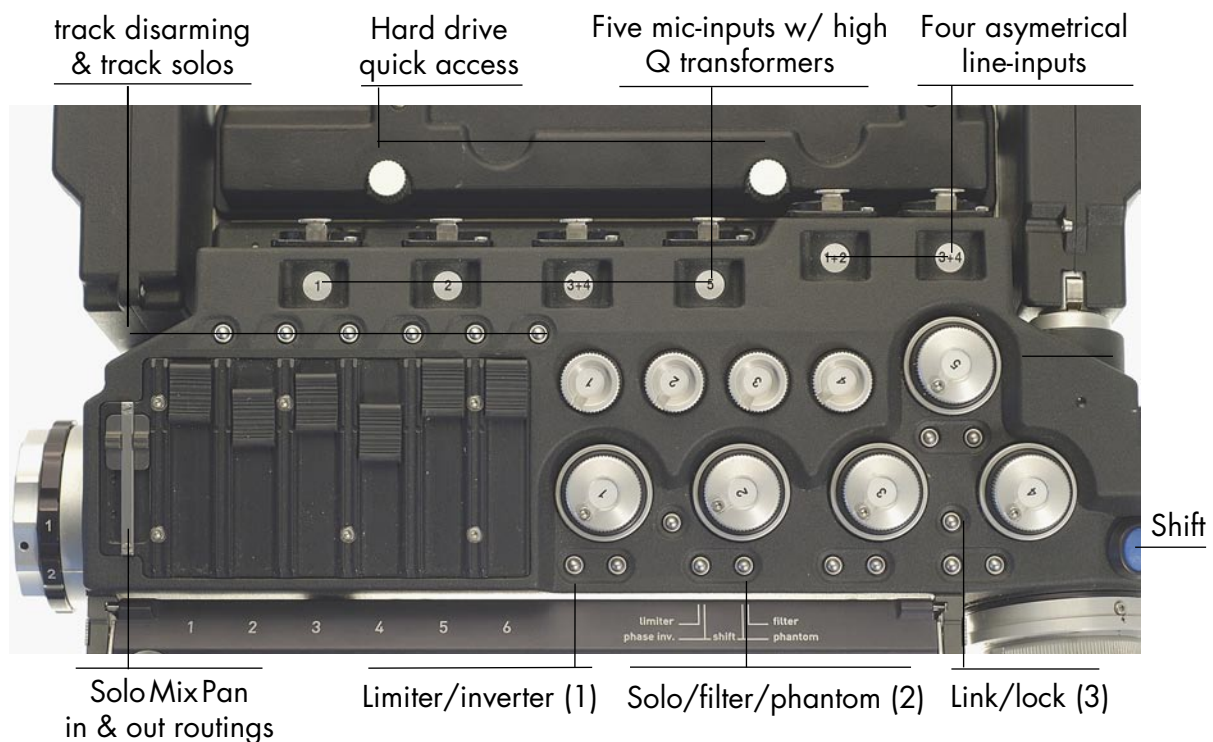
**note:** All Cantar-X1s can be upgraded to fully featured X2s.

## Permanently accessible faders

The Cantar interface is the easiest to use under the most technically demanding conditions:

- It offers the largest display surface of all portable recorders, which simultaneously shows every critical recording parameter.
- The custom designed high contrast displays remain viewable under bright light (sun, sand, sea, snow, storm), and at very low temperatures too.
- The swiveling front panel always provides the best viewing angle for both on cart and over the shoulder work.

- The large twelve position MainSelector eliminates diving into numerous sub-menus.
- The unique three-crown turret gives instant access to all recording and monitoring configurations, even while wearing heavy winter gloves.
- Nine rotary faders (analog inputs) plus six linear faders (mixdown), each entirely devoted to one specific task, are faster to handle than multi-function knobs.
- An important consideration for those who work in the desert or on the high seas, all of the mechanical actuators (faders, sliders, buttons, selectors) are sandproof and waterproof.



[lim-inv] (1) Limiter ON/OFF.  
[shift] [lim-inv] Signal Inversion.

[so-fil-tom] (2) Solo & Filter. Balance access.  
[shift] [so-fil-tom] Phantom 48V activation.

[link-lock] (3) Left (un)locks Mixer sliders  
Right (un)locks Mic/Line faders.  
[shift] [link-lock] Links Mic 1/2, Mic 3/4.

[Solo Mix Pan] pushed to the bAttery side:  
·[routing] displays the inputs to *trAcks*.  
·[track-solo] (end of slider button) shows *pAn-pots*.

[Solo Mix Pan] pulled to the Operator side:  
·[routing] displays the outputs to *mOnitors*.  
·[track-solo] (end of slider button) activates track *sOlo*.

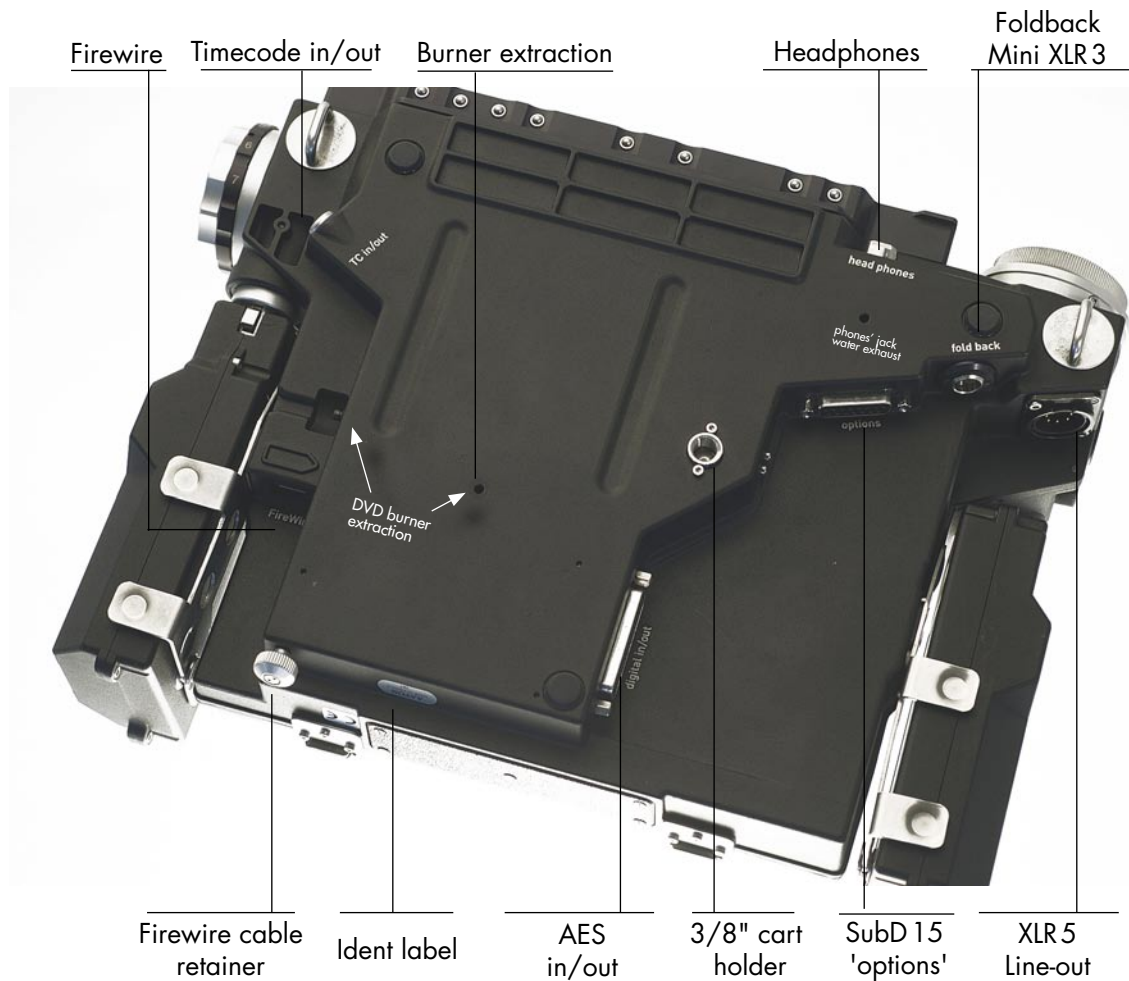
## Protected ins & outs

To complement the waterproof design, all audio sockets are pointed toward Earth, the same direction that rain falls. This concept has the notable side effect that no plugs protrude from the sides; this allows third party designers to build very narrow 'Made for Cantar' carts!

- The **SubD 15** (p.51) is used to connect CantaRem (p.47) or a USB-PS2 keyboard adapter .
- The **SubD 25** (p.51) is the AES in/out connector which can loop playback signals when in "REC&PLAY" mode.
- The **3/8" screw** is placed at the center of gravity

between three rubber pads, and is used to secure the Cantar onto a cart.

- The **weep hole**, underneath the phone-jack socket, is a drainage port for water that has entered through the phone-jack.
- To **extract** the internal DVD/DVD-RAM burner, first remove its lateral retaining screw, then use a pencil or tooth pick in the DVD extractor hole to push the drive out of the Cantar housing (see the DVD burner extraction arrows on the picture below).



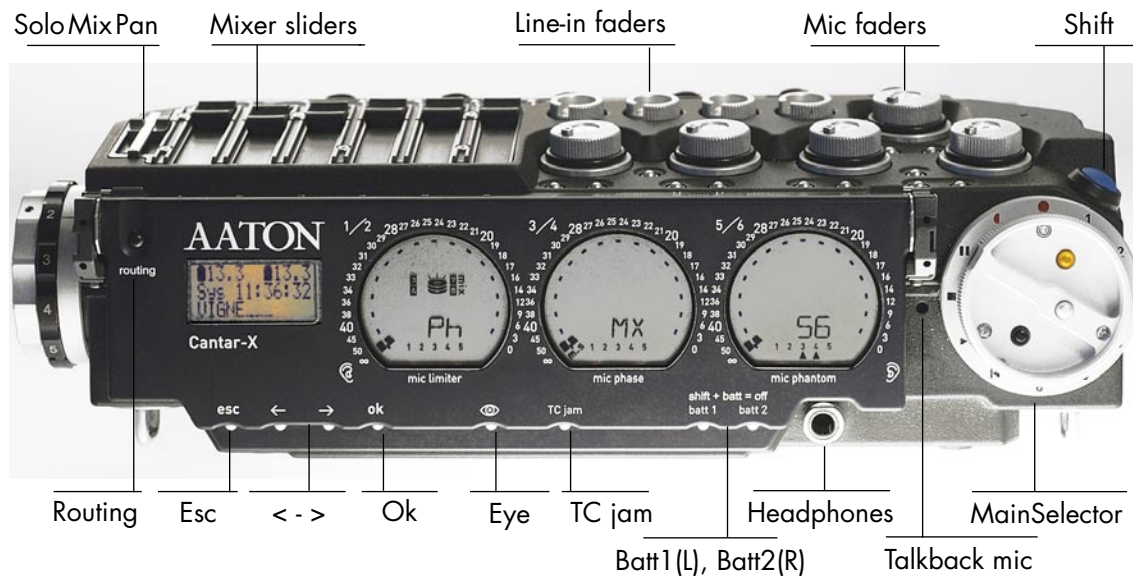
Please remember the following about the **FireWire** connection:

- The **cable retainer screw** should be used at all times (use gaff-tape if your Cantar is not equipped with it) to avoid intermittent contact or sudden cable pull-out. A loose Firewire connection can induce 'bus hangs' and can even stop recording on both the external and internal disks.
- **DO NOT** plug a cable into the Cantar Firewire socket

**while it is powered.** The Firewire 6 socket that powers external disks and burners has a HOT 12V pin in it. If the plug enters at an angle, it will produce a short between the +12V pin and the in/out pins and DESTROY the Cantar Firewire driver. Please follow the HDD formatting instructions (p.35).

- Only use **ferrite choke ring** equipped high quality Firewire cables.





### Front panel buttons

- [routing] [Solo Mix Pan] battery side: In-grids.  
 [routing] [Solo Mix Pan] operator side: Out-maps.
- [esc] pause/restart from there.  
 [shift] [esc] in PLAY, *continuous play of files toggle.*  
 in PPR, *'comment' line erasure.*
- [<] [>] prev/next play-card (p/n file if no card)  
 in 'Operands', other parameter value.  
 [shift] [<] [>] prev/next play-file.
- [ok] start/stop playback; in 'Operands' push  
 focus to bottom row; value validation.  
 [shift] [ok] digitization parameters and TC fps view.
- [eye] in 'Operatings', toggle T5/6 & T7/8  
 on right screen; in 'Operands', 'Help'.  
 [shift] [eye] toggle rectangular screen bottom row:  
*'filetag&duration' or 'scene&take'.*
- [TC jam] in PLAY, absolute TC; in TEST, a 3 sec.  
 pressure sets Sync clock to incoming LTC.  
 [shift] [TC jam] in TEST, stops 'int c' reminder blinking.
- [batt L] or [R] short pressure: battery voltage;  
 long pressure: battery on duty.  
 [shift] [batt] in STOP, turns 'OFF' Cantar.

### Headphones

1/4" jack in an isolated compartment. The headphone amplifier is powerful enough to drive loudspeakers down to 8 ohms. The stored output level of the headphones is protected by the [shift] button.

### Talkback mic

Nested near the MainSelector, the automatic gain talkback mic can be routed to Line-out, Foldback and tracks (p.10).

### Circular and Rectangular screens

Always visible under the brightest light (p.7 & p.8).

### TripleCrown and MainSelector

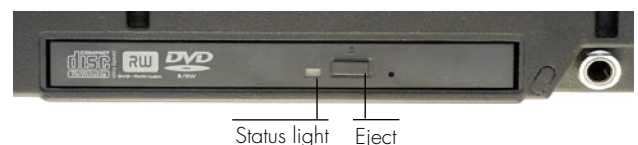
Easy to manipulate even with winter gloves on, they give access to all operating actions and operands (p.9, p.10 & p.25).

### Mixer's faders

Dustproof and waterproof, they are magnetically driven. The black sliders can be easily replaced with colored ones.

### DVD burner

The burner is protected by the swiveling front panel, to replace it see p.5, p.41 & p.51. The currently installed Matshita UJ-85J DVD-RAM /±R burner is a slot machine.



## Circular screens

These are the largest, easiest-to-read screens found on any audio recorder. They provide the user with ongoing data concerning every aspect of the machine's operation while it is operating. It takes a few hours getting used to them since five display paradigms are used for the many functions they handle. Once you are familiar with these functions, you will drive the fastest machine you have ever driven.

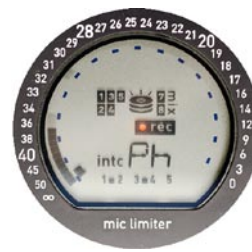
- input grids. The six primary tracks graphically display their links at the push of a button, even while recording.
- output maps. Thanks to the three screen lay-out emulating the left, both and right 'ears', the monitor maps are immediately understood.
- progressive pan-pots. The contribution of each track to the mixdown has never been so clear.
- circular modulometers. Their round shape makes the signal level easy to appreciate in a wink.
- monitoring physical status. Permanent control of the disks, tracks, and setups.

## • Input grids

The available 'Inputs' are shown in each circular screen: Line-in 1 to Line-in 4, Mic 1 to Mic 5, Digi 1 to Digi 6. The six tracks to which they can be connected are grouped in pairs, e.g. T1 T2, T3 T4, T5 T6 on the three screens. The method of creating routing-configurations by linking inputs and tracks is explained in the section 'Routing inputs to tracks', p.26.



With the [SoloMixPan] slider pushed toward the battery, the [routing] button (top-left of the swiveling panel) instantly displays the 'inputs to tracks' grid, even while recording. In the picture above the middle screen displays 'A4', the routing in use. Fifteen preset routing grids are stored in three banks. Each of which holds five grids, to help you sort and memorize your configurations, e.g. A1 to A5 for mic only setups, B1 to B5 when some line-inputs are on duty, C1 to C5 for complex setups that include digi-inputs. The [config] crown gives instant sequential access to all of them.



## •• Output maps

Here is where Cantar's three screen 'mapping' is at its best. Audio signals going to the left ear show on the left screen, signals to be listened to in mono show on the middle screen and those going to the right ear are on the right screen. All inputs (*recorded or not, very useful in Rec&Play*), and all tracks can be monitored along different configurations for each of the eight independent outputs channels: **Ph** Phones, **Lo** Line-out, **Fb** Foldback and **Do** Digital-out. 26 different 'output routing' maps are available; the black [monitor] crown gives instant access to all of them, see p.28.



In the example above, the 'Ph d' phone routing indicates: Track 5 goes to the left ear, Track 1 and Track 2 go to the center (both ears) and Track 6 goes to the right ear. With the [SoloMixPan] slider pulled toward the operator side, pressure on the [routing] button instantly displays the current monitor configuration.

**note:** the [routing] button is required to change from one grid to another, it is a protection against wild and lethal changes, but it is not required to change from one map to another in the course of a recording.

## ••• Pan-pots to the mixdown

Push the [SoloMixPan] slider toward the battery side, press the [track-solo] button next to the mixer linear fader: the pan-pot of this track goes under [jog] control and indicates its left/right contribution to either channel of the mixdown.



T1 & T2 left T3 center, T4 left T5 left, T6 right

The spatial position of all pan-pots is visible on the circular screens while the dBFS value of the selected pan-pot is displayed in the rectangular screen (see next page).

### •••• Circular modulometers

Cantar's large circular modulometers, visible under the brightest light as well as in the dark, are the most accurate metering tools found in any portable recorder. They feature a non-linear scale with increased resolution (1dB) in the most important range: -5.5 to -40dBFS (5dB per segment); -40 to -32dBFS (2dB / segment); -32 to -12dBFS (1dB / segment); -12 to 0dBFS (3dB / segment).

The peak level segment hold duration is adjustable from 0.5 to 5 seconds (see TECHSET.12).

The Tracks are grouped into 'natural' pairs: T1 T2, T3 T4, T5 T6. When a track is momentarily dis-armed, its modulometer appears dashed.



### ••••• Monitoring physical status

The center of each circular screen continually displays the status of the main recording elements:

- activity of the internal HDD ('three-platter' icon on the left screen), the external HDD ('three-platter' icon on the middle screen), and the DVD ('one-platter' icon on the right screen). Disk activity is highlighted by the presence of the track IDs recorded on it.



left screen  
Internal HDD

middle screen  
External HDD

right screen  
CD/DVD

- sync clock mode: either master **int c** or slave **ext c**.
- mic preamplifier status: Limiter on/off, Direct/Invert, Phantom on/off.
- the current monitor map name (sent to the phones too) is constantly displayed by large alphanumeric characters.
- the activation of the **mixdown recording** on T7 T8 is indicated by the '**mix**' icon next to the '7' and '8' black squares.

**note:** the screens are visible in very bright sunlight, to save backlight power, see TECHSET.03 'Backlight' (p.32).



### Rectangular screen

#### • 'Operating' functions control (p.10)

V16.2 V14.8  
Sys 12:45:22  
2007-11-24

In STOP

*top row:* batt-L & batt-R voltage

*middle row:* system time

*bottom row:* system date.



In TEST or REC

*top row:* tracks T7 T8 modulometers. With [jog], battery voltage, available recording time, and remaining disk space. The [eye]

button toggles display of tracks T5 T6 or T7 T8 on the right modulometer.

*middle row:* the source and the TC stamped in the audio files: 'Atc' (ASCII-TC), 'Ltc' (jam from LTC), 'Stc' (from the system calendar), 'Otc' (operator entered TC), 'Rtc' (Record-Run TC), and 'Etc' (slaved to an external clock).

*bottom row:* (in TEST) current project name; (in REC) 'filetag & duration' or 'scene & take' by [shift] [eye]. While adjusting a pan-pot, the track rank, plus the maximum gain value of the whole mixer panel (0dB or +6dB) are displayed.

NEXT AX0490  
Seq Sc Tk  
121R/a12t06

In PPR or BROWSE

scene, take, track-names, comments, Sound-Roll/Shoot Day, for their editing (p.18 & p.24).

A00\* >00:00  
02:15 02:17  
CC2165 03:32

In PLAY

player's position, cue points, absolute time, 'filetag & duration' or 'scene & take' (p.23).

#### •• 'Operands' functions control (p.25)

In IN-GRIDS, AUDIO/TC, TECHSET, SESSION and BACKUP, the pathtree of each parameter is displayed.

AUDIO/TC 01  
SampleRate  
48048

*top row:* the 'Operand', e.g. AUDIO/TC.

*middle row:* parameter name, e.g. SampleRate.

*bottom row:* parameter value, e.g. 48048.



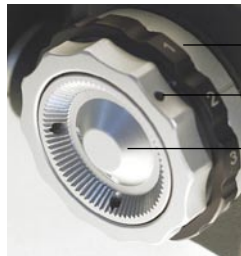
### Triple crown

The large all weather triple crown is used to verify and select the input routings and monitor maps with only one hand.

#### Monitor Crown

- 1 So** Mic, Line-in and Digi-inputs, plus active tracks are directly selected and sent to the headphones as 'solos'.
  - 2 Ph** Mixer output and seventeen user configurable maps (A to Q) to headphones.
  - 3 Lo** Mixer output and nine user configurable maps (R–Z) to dual Line-out (XLR 5).
  - 4 Fb** Mixer output and nine user configurable maps (R to Z) to dual foldback out (mini XLR 3).
  - 5 Do** Mixer and nine user configurable maps (R to Z) to Digi-out on AES7&8.
- note:** the headphones also receive the signal sent to the output being configured.

#### Config Crown



- [SoloMix**Pan**] slider pushed toward the battery, the [routing] button displays the In-grids configs on the three circular screens.

- [SoloMix**Pan**] slider pulled toward the operator, the [routing] button displays the Out-maps on the three circular screens. These screens respectively become left, both and right ears.

In REC, since the Out-maps checking has no interaction with the ongoing recording, it is possible to select another map for any of the available outputs with the [config] crown.

In TEST and PPR, the [config] crown browses the In-grids (inputs-to-tracks routing) and selects the one shown when the [routing] button is released.

In REC, the grids can be checked but not mistakenly changed, see 'T1–T6 routing selection', p.27.



#### Jog Crown

The [jog] is used to move the cursor in the routing circular screens, to edit the scene and take, to select high pass filters, to adjust the backlight's intensity, to control the pan-pots, and to scrub the player in fast forward/reverse.

**note1:** [shift] [jog] accelerates the speed 10x.

**note2:** the Operand's middle and bottom rows of the rectangular screen can be browsed by the [>] [<] arrows just as easily as with the [jog].

**note3:** as of v2.13, both the Jog and the Config crown are incrementing all parameters in the same clockwise direction.



MainSelector West positions

The MainSelector is easy to manipulate even while wearing heavy winter gloves; it gives direct access to all essential functions.

The six **OPERATING** (West) positions control the recording, annotation and playback of audio files. To get access to the Rec&Play **BLUE-XX** positions, press and hold the blue [shift] button while rotating the [MainSelector], see p.44 & p.45. *(The six **OPERAND** (East) positions, which establish Cantar's operating parameters, are described on p.25).*

Std. pos.		Blue pos.
REC	●	BLUE-REC
PPR	(	
TEST		BLUE-TEST
STOP	■	
PLAY	>	BLUE-PLAY
BROWSE	⏮	BLUE-BRWS

MainSelector buttons

[black], [silver] and [red]\* buttons can be activated by the thumb, while the blue [shift] button may be pressed by the index-finger.

[silver]	in REC, insert a marker on-the-fly. in PLAY, go to operator record marker.	[red]	in REC, PPR, BROWSE, changes take-type. in BLUE-PLAY, inserts a cue-out. in IN-GRIDS, unlinks an input from a track. in OUT-MAPS, disconnects sources from outputs.
[shift] [silver]	in REC, trigger AutoSlate detection. in PPR, toggle take editor (PREV/NEXT take). in TEST, open LEVEL&DELAY settings. in PLAY go to AutoSlate marker.	[shift] [red]	in TEST, PPR, REC, 1 kHz reference tone: 'Off' at [red] release, remains 'On' if [shift] released first, press [shift] to turn 'Off'. in BLUE-PLAY, hide play-card from Rec&Play list.
[black]	in REC, PPR, TEST, talkback mic activation**. in PLAY, inserts a play mark. in BLUE-PLAY, inserts a cue-in. in IN-GRIDS, links an input to a track. in OUT-MAPS, connects audio sources to outputs.		
[shift] [black]	in REC, PPR, TEST talkback mic to active tracks. in PLAY, plays from start of take.		

\* The red button may appear red/gold  
\*\*AUDIO/TC.04, p.30



## Starting & Stopping

To turn 'ON' Cantar, set the [MainSelector] to STOP, press the [batt L] or [batt R] button for a couple of seconds. The rectangular screen lights up to confirm that Cantar is powered. On the left circular screen, the 'three-platter' icon blinks for 3 to 5 seconds, the time it takes the disk to wake up; it is surrounded by the icons of the currently routed tracks. The rectangular screen displays batt-L and batt-R voltages, plus the system day and time.

To shut down Cantar, set the [MainSelector] to STOP, maintain pressure on the blue [shift] button and [batt L] or [batt R] until 'AU REVOIR' is displayed. As a safety measure, if you are not in STOP, nothing happens.

**Reminder:** while in STOP, internal HDD sleeping, the current drain is a mere 270mA. To keep the internal sync-clock running, do NOT turn 'OFF' Cantar during the workday.

## Twin battery safety

Cantar's low power consumption electronics offer the longest operating time of all portable eight track audio recorders. With a single set of on-board Li-Ion batteries, the eighteen hour Cantar outperforms all other recorders. And with the twin battery system you will never be taken by surprise. **While working on a cart from a mains power supply, leave a battery onboard and activate both inputs:** the battery will buffer possible mains power problems or the power cord being accidentally disconnected. To avoid charging spikes, the battery which remains on-board is not charged, just not discharged while Cantar is connected to mains power.

## Mains power supply

Only use a low ripple, 14V max, power supply able to sustain a 4A surge at Cantar's startup. If it is not able to deliver the surge current, plug a NiMH (1.2V) battery on one side and connect the power supply (14v) to the other. Activate both inputs: the battery will supply the surge and then will be off duty thanks to the power supply higher voltage. **NEVER** use a battery charger, its idle voltage can go up to 24V; a Cantar killer.

## Voltage

**Minimum:** when the active battery drops 300mv below the operator entered Batt Alert level, both inputs are put on-duty. This allows the simultaneous use of a 12.5V NiMH battery with alert level set to 10.5V, and a 14.4V Li-Ion battery with alert level set to 12.4V (see TECHSET.14-15, p.32); alert level reached, a two beep alarm is sent to the headphones;

the rectangular screen displays BATT LEFT (RIGHT) LOW. While in REC, both batteries are automatically put on duty, in case you unplug one by mistake.

**Maximum:** 16.6V is the maximum voltage which can be applied to Cantar, including the Firewire socket. No problem with Mac laptops and PCs, they deliver a safe 12V. **Never connect MAC G3/5 desktops delivering 30V on the Firewire socket**, extract the HDD from Cantar and connect it directly to the Gs (it can sustain up to 40V).

## Battery check

In TEST, [jog] to display the battery voltage. It also appears in all positions whenever you press the [batt L] or [batt R] button. Pressing a battery button for more than two seconds puts the battery on-duty.

## Power Consumption

STOP: 270mA (sleep mode), 420mA (HDD running)  
 TEST: 600mA (AES Off, Phantom Off, Heater Off)  
 REC: 650mA (AES Off, Phantom Off, Heater Off)  
 AES: 100mA; Phantom: 10 to 20mA per mic (60mA total); Heater: 500mA (until reaching +4°C under screens); Ethernet: 50mA.

## Lithium-Ion batteries

The 14.8V/4.2Ah Aaton Li-Ion R-Cells are more powerful and lighter than their NiMH equivalent (61Wh vs 45Wh, and 560gr vs 695gr). To avoid their destruction by NiMH chargers, the XLR4 pin-4 is protected by an 80V reverse voltage diode; pin-3 is directly connected to the cells.

- Charger LED status: **red/orange**, two hour charge to 85% capacity; **amber**, three hour top-up; **green**, charged. *Before connecting a battery, reset the Mascott charger 9940 (Li 4-cell 2A @14.8V) by turning it 'OFF' for 4sec.*
- Supply pin-out: +Batt current is either flowing through the pin-4 diode to film cameras and Cantars under #268, or through pin-3 to Cantars having an XLR4 socket with pins 3&4 tied together.

## IMPORTANT NOTICE

- Flight rules: "NO Lithium-Ion batteries in stowed luggage. Under 8gr of lithium content, carry on as many as you want within size and weight limits. Between 8gr & 25gr, carry on no more than two batteries with a total lithium content between them of 25gr max." At 5.8gr, Aaton R-Cells fall within the first category.



## Project, Day & Files

### Error-free filing with NO disk partitioning!

When you cold-start Cantar, it assumes you want to continue working on your latest project, which is displayed at the bottom of the rectangular screen.

When you rent a Cantar, its project memory should be empty; the rectangular screen should display 'No Project'. Once created, a 'project name' regroups all data related to it, such as the days of recording, the tracks and the disks used. This name is stored in each audio file, there is no risk of a file getting lost in a maze of terabytes.

Unlike other machines, the Cantar file sorting system doesn't rely on disk partitions. Instead, it uses the 'Project/Work Day/Filetag' path tree, which allows for the intuitive and safe retrieval of any audio file on unpartitioned disks, anywhere along the Post chain. It is **not** operator-error prone.

### 1. Project

If you are in a bind and have no time to select a project in SESSION.01 'ProjectName' (p.35), go directly to REC, your audio files will be stored in a project named AACANTAR. Later, with Majax you will move these audio files out of the 'AACANTAR' folder and into the project directory you would have created in the mean time.

**note:** in their iXML chunk, the moved files still hold 'AACANTAR' as the Project Name. You will need to manually replace that provisional name with the correct name.

### 2. WorkDay

At startup Cantar displays 'New Workday?' giving you the opportunity to say 'NO'. Note that going to TEST or REC is a way to say 'YES'.

New Workday?  
No = [esc]  
Yes = [ok]

v13.5 V13.9  
Sys 12:29:14  
2005-03-22

The 'workday' is not the same as the actual 'time-of-day' as defined by the sync clocks, it is an interpretation of the 'human' day (see next page).

The Cantar recorded files are multi-monophonic, i.e. independent files stored in a 'workday folder'. That folder is automatically created at the start of each day and is named for the date, e.g. 20041206.AAD (see 'Calender Time', p.13).

Because original multi-monophonic files sometimes have to be interleaved into large polyphonic files for crippled

editing machines, Cantar also builds an .AAP suffixed 'shadow folder' which stores the associated polyphonic files for the day, e.g. 20041206.AAP.

### 3. Filename

In 1997, the Aaton Indaw multitrack digital recorder introduced the Aaton filename system. Each filename consists of: a unique machine generated *filetag*; an optional *descriptor* that displays the scene, take-type and take; a *suffix* that indicates the type and sequence of the file.

The aim is to perform these tasks while remaining compatible with EDL standards which only handle '8+3' DOS filenames, and with Mac OS9 which is limited to 31 characters.

- The automatically incremented six character *filetag* (AD1234), differentiates 6.7 million takes, a sound mixer's lifetime! (Indaw generates a 3 letter and 3 number filetag for 17.6 million takes). The filetag must remain untouched all the way through the final mix. One filetag represents a complete 'file group', e.g. AD1234 is the unique filetag of eight monophonic files from AD1234\_1 to AD1234\_8 and of its associated polyphonic file, e.g. AD1234PR.
- The *descriptor* displays the scene, take-type, and take #, e.g. scene A18:2a, take-type t, take 04.
- The *suffix* is used to flag the nature of the file, either multi-monophonic (\_1 .. \_8), or interleaved poly-Native (PN), or interleaved poly-Rotate (PR), or poly miXdown (PX).

See 'Cantar Post Chain' <http://www.aaton.com/files/cantar-post-chain-22.pdf>

#### Filename examples

A short filename: AD1234\_1.wav

A long filename: AD1234==A18:2a t04==\_1.wav

#### A questionable file?

Ask Aaton to give you access to their file-repair FTP site. If you don't have an ftp client, download the excellent 'Cyberduck' freeware from <http://cyberduck.ch/>

#### An operational problem?

Go to TECHSET.03 'Save Setup', and create a Setup file to be e-mailed to [cantar-support@aaton.com](mailto:cantar-support@aaton.com), this will help them solve your problem.





## Calendar and Sync Times

Time is the essence of a digital audio recorder. Cantar uses two kinds of time: 'CalendarTime' organizes folders and files, 'SyncTime' links audio and picture.

### Calendar Time

*System date* and *time* run on a medium precision clock which automatically creates the workday folders. This clock is powered for four to six years by a user replaceable 3V Lithium CR1220 button battery located below the HDD compartment.

In STOP, the system date and time displayed on the rectangular screen must be checked for a  $\pm 5$  minute consistency with the time-zone you are working in; think of it when you get off of a three-hour flight.

This clock is very important for the file management; go to TECHSET.21 'System Time' and press [ok], a triangle points to the modifiable digit. Using [jog], select the desired value, then press the [>] or [<] to move on to the next column, and so on, [ok] to exit. Power 'Off' then 'On' Cantar for the CPU to acknowledge the new system time.

The *Workday* is related to the date defined by the calendar clock but not totally a clone of it. The workday is an interpretation of the 'human' day; its duration can be from 6 AM in the morning to 3 AM in the deep night next day. If you turn 'OFF' the batteries after midnight, Cantar thinks the operator has gone to sleep. But if your 'workday' is continued into the wee hours after a midnight snack, you would probably not want it to be considered a 'new' workday. That is why Cantar displays 'New Workday?', giving you the opportunity to say 'NO'. Note that going to TEST or REC is a way to say 'YES'.

Thus, if you stop working at 2 AM one day, the audio files are technically still part of the previous workday. Conversely if you want to start a new workday right after midnight, just turn 'OFF' Cantar, then turn it back 'ON' and answer 'YES' or go to TEST.

### Sync Time

At startup you will notice a blinking **int c** or **ext c** icon, depending upon the master (internal clock) or slave (external clock) mode selected in AUDIO/TC.14 'TC Source'. This blinking icon reminds you to verify that the same timecode is running in all of the camera(s) and audio recorder(s).

*Four syncing methods can be used:*

### Method 1

#### 'int c' internal **Free-Run** master-clock

Set AUDIO/TC.14 'TC Source' to 'Int.Clock'. The internal TCXO 1 ppm clock keeps the time accurate to within  $\pm$ one frame in nine hours; this time is used to stamp the sound files with the very same TC as the one stamped on the camera's images. This is the AatonCode method. In the video world they called it the '*free-run*' mode. Once initialized (four ways) Cantar behaves as an independent *master-clock*.

#### • System/Calendar initialization

At startup, Cantar uses the System/Calendar date and time to immediately initializes its internal high stability, 1ppm TCXO, Sync clock, '**Stc**' (System-TC) is displayed in the rectangular screen. To remind you to sync other equipment around to the Cantar Sync clock, the '**int c**' icon keeps blinking until you press [shift] [TC jam]. 'Confirm Sys time' is displayed.

#### • Operator initialization

In case you don't want to use the calendar date and time, the TCXO clock can be set by the operator, see AUDIO/TC.19 'OperTc Init'. '**Otc**' (Operator-TC) is displayed in the rectangular screen.

#### • LTC initialization (from Camera, VTR, GPS, etc.)

Cantar on TEST press [TC jam] for more than two seconds, this makes the entered SMPTE LTC jam the Cantar TCXO clock. '**Jtc**' (Jammed-TC) is displayed in the rectangular screen. [TC jam] has no effect if there is no valid timecode on the LTC inputs, '**Jam Failed No LTC**' appears in the rectangular screen and the '**int c**' icon continues to blink.

#### • ASCII initialization (from Aaton OriginC)

Cantar on TEST, its TCXO clock is set by an Aaton OriginC which also initializes cameras and GMT generators. '**Atc**' (ASCII-TC) appears in the rectangular screen.



### Cantar becomes a master-clock

As soon as the **int c** icon stops blinking, Cantar starts generating timecode. This timecode is based on a TCXO (Temperature Compensated (X)crystal Oscillator), accurate to  $\pm$ one frame in nine hours (1 ppm). This high accuracy makes Cantar THE timecode reference on set.

If you turn 'ON' the LTC generator output in AUDIO/TC.16 'LTC Gen Out', the LTC output can be used to continuously sync all equipment through cable or RF. You can also initialize several Aaton GMTs (low power, high accuracy, timekeepers), attach them to the cameras and digi-slates and have TC that matches the Cantar's TC.

### Do not power down a master-clock!

Being on a job on which the free-run time-of-day TC is the essence (AatonCode camera, HD camera with GMT reference generator, smart digi-slate), never power down Cantar during the workday to avoid the loss of its 1 ppm reference time! While the internal HDD is in sleep mode the total power consumption is a mere 270mA! Set TECHSET.16 'HDD Pwr Dwn' to 'Afr 5min', to have the HDD sleep five minutes after STOP. If you still want to power down Cantar at lunch time, the blinking **int c** icon at power up will remind you to re-initialize its own sync clock and all other timekeeping machines on the set.

## Method 2

### 'int c' internal **Record-Run** driving clock

Go to AUDIO/TC.18 'RecRun Init', [ok]: 01:00:00 is proposed as the first TC of the day (it can be modified). From now on, at the beginning of each audio file Cantar will stamp a start-TC incremented by 2 seconds later than the preceding take's end-TC. This clocking, called Record-Run, produces audio files which appear as if they have been recorded in continuity.

If for some reason Cantar is turned off, the rec-run TC must be initialized again. To prevent any TC overlap, Cantar proposes to start on the next hour integer, e.g. if the last recorded take has been closed at 01:34:15, the next start-TC proposed to the operator will be 02:00:00.

The Cantar record-run mode lets you use the pre-record buffer without creating TC overlaps. For example, if the preceding take ends at 01:45:00, and the pre-record buffer is set at 35 seconds, the next audio file will start at 01:45:02

(two second gap), but the LTC emitted by the generator to the camera when hitting REC will be 01:45:37.

While Cantar is in 'Rec-Run' mode, its reference TC must be continuously sent to all cameras on the set by wire or RF.

**note:** in TEST and PPR, the LTC output is frozen on the end-TC value, it can thus be used as a master TC to start and stop another Cantar ('Remote Roll', p.18).

## Method 3

### 'int c' internal clock, **AutoSlate** on clapsticks

If the same TC is not running in Cantar and cameras, the only way to sync pictures and audio is to use clapsticks; forget digi-slates, they have too many drawbacks. The Cantar AutoSlate sample-accurate clapstick detection function puts a timecode crown over the simplest piece of wood.

## Method 4

### 'ext c' **slaved** to an external clock

An externally-slaved Cantar stamps the audio files with the same TC as the one running in the video camera. This requires a link from the camera to Cantar.

Set AUDIO/TC.14 'TC Source' to 'Ext.Clock'; **ext c** blinks in the circular screen, meaning that Cantar is waiting to be slaved to an external LTC, e.g. a video camera. *Cantar, while set to 'external clock', will only jam when you go to REC; pressing the [TC jam] button will do nothing.*

Cantar is usually in REC before the camera, so it monitors the Lemo 5/SubD 15 incoming LTC and grabs it when coherent TC is received. That is why **ext c** keeps blinking until the camera is up to speed.

Before closing the audio file, Cantar stamps the TC by using the latest valid timecode so as to eliminate spurious transmission errors and false camera starts. If there is no external timecode signal, an 'LTC Not Detected' warning appears in the rectangular screen and a phone beep is triggered every four seconds. The beep is muted during 'w' (wild track) tagged takes (see 'Warning beeps', p.22). Nevertheless, the external TC is grabbed if it is received before the take's end. Note that external LTC breaks can be used to slave the REC start and stop (see 'Remote Roll', p.18).



### Sampling Rate, Camera fps, Audio-TC

These parameters are theoretically not correlated. The number of audio samples per Earth second (Hertz), is called the sampling rate, e.g. 48000 is 48kHz.

48kHz and 96kHz are universal, The film/video 'frames per second' value should have no influence at all on the audio sample rate frequency.

The frame-rate used to express the audio time can be 30, while images are filmed at 24 or 25fps! Unfortunately, because of vintage post-machines, the NTSC drifting fps forces engineers to use tricks to sync real-time audio with drifting-time images, by using disgraceful 48048 or 47952 samples per second (Hertz).

#### On the planet Earth

Timecode handling is simple at integer speeds such as 24, 25 and 30fps. *It is more complex at 29.97DF where a drop-frame lookup table is used to keep the image frame count in line with Earth's time: the frame count jumps over two images every minute except for every tenth minute.*

Stored in the BWF metadata, the camera fps is a simple reminder and can be changed later and then applied to the audio LTC used in some audio-post sync operations.

#### [U] Universal : 24.00 ... 25.00 ... 30.00 ... 29.97DF

In a file digitized at 48kHz, the Format stamp indicates the number of samples digitized in a real-second, i.e. 48000; the Time-stamp carries the number of samples since midnight using the sample rate value found in the Format stamp. *Exactly the same logic is used in the Barebone mode-B of the 'slow-planet' recording mode.*

#### On the 'slow-planet'

Unfortunately, NTSC-compatible 23.976fps HD cameras cannot use anti-drift lookup tables because nobody ever found a clever way to emulate the counting compensation invented for 29.97fps.

When shooting HD in the U.S., the 'slow-second' still imposes its rule. *The slow-second is the time it takes to shoot 30 frames of NTSC video, i.e. 1.001 Earth second).*

As soon as you enter **Camera fps = 23.98NDF** or **29.97NDF**, Cantar knows it must work in the 'slow-second' world, its TCXO clock switches to a slower beat and the TC separators change from ':' to '\*', e.g. 12\*45\*36;

you are on the slow-planet with its 24 lazy speed (aka 23.98NDF on Earth) and 30 lazy TC (aka 29.97NDF on Earth).

Many nights of engineers' time have been spent trying to find a universal method to sync sound and images on the slow-second planet but nothing came out. In the U.S. you must ask your post-facility which one of these *three sample-stamp modes* is requested:

#### (A) Avid v11: '23.98NDF-A', '29.97NDF-A'

In a file digitized at 48kHz, the Format stamp indicates the number of samples digitized in a slow-second, i.e. 48048; the Time-stamp is the number of samples since midnight, using the 48048 value of the Format stamp.

*Introduced on the AvidMC v11.3.2, the 'A' mode is being replaced by the 'C' mode. See 'Avid-Recording-Rates' [www.aaton.com/files/avid-recording-rates.pdf](http://www.aaton.com/files/avid-recording-rates.pdf).*

#### (B) Barebone: '23.98NDF-B', '29.97NDF-B'

In an audio file digitized/recorded at 48kHz, the 'B' stamp indicates the number of samples digitized in a real-second, i.e. 48000; the Time-stamp is the number of samples since midnight using the 48000 value of the Format stamp.

*While images and timecode are beating the slow-second, the audio remains on Earth! Since recent post-machines (e.g. Indaw) perform high quality real-time sample rate conversion, 'Barebone' and 48kHz should be THE choice.*

#### (C) Compensated: '23.98NDF-C', '29.97NDF-C'

**Mode for challenged post-machines:** in a file digitized at 48kHz, the Format stamp indicates the number of samples digitized per real-second, i.e. 48000, but the Time-stamp is the number of samples since midnight as digitized in slow-seconds, i.e. 48048 (no longer the Format stamp value!), hence the 'F' suffix (for Fake or Faux) used by some manufacturers.

*If it is 02h00m00s on Earth at REC start, the Time-stamp shows 345,945,600 samples (02h x 3600s x 48048).*

## Audio inputs

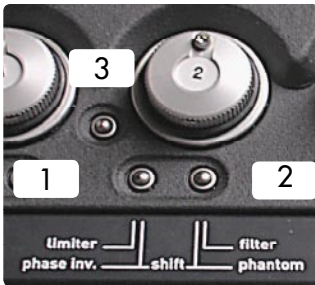
The TEST position opens access to audio inputs testing: five microphones **M1** (XLR3) **M2** (XLR3) **M3-M4** (XLR5) **M5** (XLR3), four line inputs **L1-L2** (XLR5) **L3-L4** (XLR5), eight digital inputs **AES1-8** (Tascam SubD25 p.51).

## Microphone Preamps

The Cantar mic-preamps offer such a wide dynamic range in one stroke that they don't need any pre-conditioners or trims.

## Phantom power

Press **[shift] [so-fil-tom]** (2) to toggle that mic's phantom power 'ON/OFF'. The default setting for Phantom 48V is 'ON' for all mic-inputs. When connecting a dynamic microphone, turn 'OFF' the phantom power; the mic-preamp gain will be boosted by 12dBu. When the phantom power is disabled, the triangle below the mic number disappears from the right circular screen.



## Limiters

Press **[lim-inv]** (1) for two seconds to toggle the limiter 'ON/OFF'. While the limiter is turned 'ON', a triangle is displayed below the mic

number on the left circular screen. If the signal level reaches the limiter zone (-8dBFS), the triangle will start blinking. In 24-bit recording mode, it is common practice to adjust the input gain so that a 'normal' signal does not go over the -20dBFS level. When the limiter is activated, the 32dBu head-room above the -8dBFS kick-in point gives 24dBu above the 'no-limiter' full scale. The operator can count on a 44dBu reserve over the normal -20dBFS level. If the signal does reach the -1dBFS level, a 'clip' icon appears at the end of the modulometer scale and a beep can be sent to the headphones (TECHSET.08 'Clip Detect').

To maintain equilibrium between linked channels, the same limiter command is applied to ganged preamps.

## Inversion

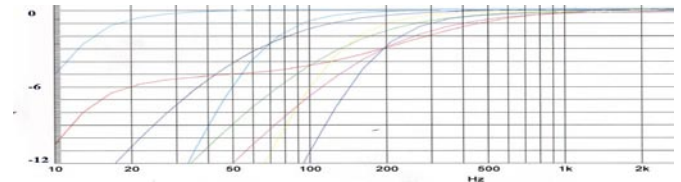
Press **[shift] [lim-inv]** (1) to invert the phase of a mic-input signal; a triangle appears below the concerned mic number on the middle circular screen.

## High-pass filters and line attenuators

Click a **[so-fil-tom]** button (2) to open its filter adjustment screen, another click on any **[so-fil-tom]** button closes it. In



between these two clicks you can **[jog]** through the filter selection screen... quite useful when working over the shoulder with a boom in the other hand. Continuously leaving the finger on the button simulates both clicks: when you remove it, the filter screen closes itself.



Three high-pass filter banks are successively displayed in the rectangular screen, they offer the same corner frequencies/attenuation slopes (from 60Hz/-6dB to 180Hz/-12dB and LFA).

**Mic Level bank:** 'Mic Level - Linear' is the default setting on all mic-inputs. **High Level bank:** an 8dBu firmware translation of the gain command puts the fader knobs in the same angular position as when a standard sensitivity mic is used.

**Line Level bank:** a 24dBu physical attenuator converts the mic-inputs to line-inputs (available on SL1 preamplifier, i.e. all Cantars from #268).

## Differential delays

*Cantar-X2 only*

Delays inherent to sound propagation (3ms/m) or induced by signal processing (up to 3.8ms in a digital wireless kit) can induce 'phasing' interference between mics placed at different distances (or time) from a sound source. In some instances it is advisable that all other audio inputs contributing to the onboard mixdown wait in a buffer for the 'late-sound' arrival.

In TEST, press **[shift] [silver]**, 'Toggling to LEVEL&DELAY' is displayed, **[jog]** from DELAY.03 'Mic1' to DELAY.11 'Line-in4'; press **[ok]** on the one to be set, **[jog]** from 0.0 to 85.0ms delay in 0.1ms increments (1ms increments by **[shift] [jog]**). Fine tune the delay by listening to the tracks in 'double-solo' (see 'Solos of the tracks', p.21). To protect your ears, a short mute is triggered each time you modify a delay. Note that the value of the longest delay is applied to all other channels except for the one being set.

Example: you want a digital wireless lavalier (3.8ms processing delay) feeding Line-in 1 to be in-phase with a boom at 6m distance (18ms sound propagation time) feeding Mic5. Set Mic5 at 18ms and Line-in 1 at 3.8ms. All analog inputs will



be buffered by 18ms but Line-in 1 by (18 – 3.8) 14.2ms, and Mic5 by 0.0ms.

On the timecode side, since the group delay can go up to 85ms (two film frames), the TC stamp in each audio file is corrected accordingly. Each analog input delay is noted in the BWF's iXML chunk and in the CSV SoundReport file.

## Mic Coupling

In AUDIO/TC.10 'Mic Links', select '1+2 3+4' (default), or '1+2+3'... Phantom, Limiter and Highpass-filters are identically applied to the coupled faders. Phase inverters remain independent. All of these couplings remain active when the Cantar on-board faders are taken over by the **CantaRem** linear sliders.

### Stereo-pairs

Set AUDIO/TC.10 'Mic Links' to '1+2 3+4'. Press [shift] [link-lock] (3) between the Mic1 and Mic2 faders; a dot appears between '1' and '2' in the bottom of each modulometer; Mic1 becomes the master of Mic2. Press [shift] [link-lock] (3) between the Mic3 and Mic4 faders; a dot appears between '3' and '4' in the bottom of each modulometer; Mic 3 becomes the master of Mic4.

### Surround sound

Set AUDIO/TC.10 'Mic Links' to '1+2+3+4+5'. Press [link-lock] (3) between Mic 1 and 2, Mic 1 becomes the master.

### Masters and slaves

Whenever you rotate a fader, all fader values are displayed on the rectangular screen; the master(s) is 'highlighted' by a black square, the slave(s) by a pipe. The slave tuning range is  $\pm 12\text{dBu}$  of its master's value.

### Protecting the balances

Provided the balance has been locked in AUDIO/TC.09, the tuning of slaved prefaders is protected against flying fingers (a key appears in the rectangular screen). Balance modification can only be done while pressing the [so-fil-tom] button (2). The memorized gain value is displayed in dBFS on the rectangular screen, the physical position of the fader is shown by < > signs. There is no sudden level change if re-activation takes place when the fader is positioned in such a way that the 'pipe' sign is displayed.

## M/S pair handling

While routing inputs to tracks (see 'M/S Declaration', p.27), and passing over the 'm-s' icon, activate it to make the monitor decode the M/S signals into M+S and M-S, i.e. L/R stereo. For M/S *mono* monitoring, see 'Pan-pots', p.21.



## Locking the Faders

Press the [link-lock] (3) button (between Mic 1 & Mic 2 faders) to (dis)able the mixer's linear faders; press the [link-lock] (3) button (between Mic 3 & Mic 4 faders) to (dis)able all rotary faders. Any action on a disabled fader causes the rectangular screen to display '**Locked Fader**' instead of its gain value. To prevent inadvertent (un)locking, the button must be pressed for a full second for the action to occur.

## Headphones

To facilitate extraction of a right angle 1/4" jack plug, the headphone socket is slanted toward the bottom of the machine. This makes a long straight plug hit the table on which you put Cantar. The headphone amplifier can drive 8-ohm loudspeakers: a helpful feature to send playback tracks to the stage.



## Rec&Play rehearsal

read p.44 & p.45

In BLUE-TEST, the play tracks Tp1–Tp8 are sent internally to the Digi1–Digi8, then routed in the standard way. Select *In-grids* & *Out-maps*, adjust levels between digi-inputs (playback tracks) and analog inputs, and rehearse the BLUE-REC navigation (the last selected play-card will be the first to be played).

Create seven **T1–T6** in-grids: **A1** [Mic5/T1], **A2** [Mic5/T2, Digi1/T1], **A3** [Mic5/T3, Digi1/T1, Digi2/T2], **A4** [Mic5/T4, Digi1/T1, Digi2/T2, Digi3/T3], **A5** [Mic5/T5, Digi1/T1, Digi2/T2, Digi3/T3, Digi4/T4], **B1** [Mic5/T6, Digi1/T1, Digi2/T2, Digi3/T3, Digi4/T4, Digi5/T5], **B2** [Digi1/T1, Digi2/T2, Digi3/T3, Digi4/T4, Digi5/T5, Digi6/T6], select five **T7 T8** in-grids: **01** None, **02** Xa Xb, **07** Mic5 Xb, **27** Digi7 Digi8, **28** Digi7 Mic5, and you can perform the following:

### • Eight track 're-recording'

RR1= A1+01, RR2= A2+01, RR3= A3+01, RR4= A4+01, RR5= A5 +01, RR6= B1+01, RR7= B2+07, RR8= B2+28.

### • 'Remix' and 'Archive update'

Remix: RR10= B2+02. Archive update: RR9= B2+27.

With 'TECHSET.03 (p.33), save the above **A1–B2** in-grid setup. Rename it 'Clone1', loading it for your next cloning session will be a great time saver!



The **Pre-Post-Record** position is unique to Cantar, it offers three essential functions: pre-record buffer activation, meta-data entering/editing and last take erasure.

## Pre-record buffer

While the [MainSelector] is on PPR, the pre-record buffer stores the audio in a First-in/First-out (FIFO) buffer memory and dumps them to the HDD as soon as REC is activated. The '•rec' icon blinks under the disk(s) selected for recording.

Once the buffer is full, and it starts discarding the first-in audio, the middle platter of the 'three-platter' icon disappears. This is a quick way to verify the pre-record buffer length. This length can be modified (up to 35sec. @ 48kHz), in AUDIO/TC.08.

## PRE-Record Metadata entry

While in PPR, press [shift] [silver] to enter scene, take, comments, track-names and TapeRef before or after the recording of a given take. (The use of R.can or keyboard speeds up the process).

**note:** [shift] [jog] accelerates letter scrolling 10x.

### 1 Scene and Take

The first screen displays 'Seq Scn Tak'. Press [ok] to go down to the bottom line and use [>] or [<] to scroll along the characters and modify them with [jog.] Press [ok] to store and exit.

- The default template is **nnnA/nnA.nn** for 'sequence, scene, take-type and take #'. To accelerate [jog] action, this template minimizes the set of letters to those most frequently used:

- **Sequence:** three digits, followed by one character from this list: 'space', A, B, C, D, E, F, R, S, T, a, b, c, d, e, f, r, s, t, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

- **Scene:** two digits, followed by one character from the list above.

- **Take-type:** t = time sync audio, p = pick-up, w = wild track, a = announce, n = no-good. This **tpwan** is selected with the [red] button.

- **Take #:** two digits.

- An open **CCCCCCCC.CC** template is also available, (see AUDIO/TC.11 'ScTk Templt', p.30). At each new take, the sequence & scene is maintained and the take# is incremented by one. Modifying the sequence or scene causes the take# to reset to 1. The rectangular screen displays the filetag of the NEXT recording.

### 2 Comments

[jog] to 'Tk Comment' and press [ok] to activate the bottom line where the former comment appears. Characters (max: 200) can be entered with [<], [>] and [jog] but it is much easier to use a keyboard or a remote PDA with R.can.

Depending upon the keyboard [insert] key toggle status, a flickering square (insert) or a flickering pipe (overwrite) is displayed. Enter your comments. and press [ok] to validate.

**Note:** To erase the comment line inherited from the preceding take, press [shift] [esc].

### 3 Track-names

[jog] to 'TrackName 1', [ok] to go to the bottom row. [shift] [jog] or keyboard's [shift] [up/down] arrows show the available list of track-names.

Track-name completion relies upon a library of the last thirty track-names in use. This automatic process speeds up track-naming by letting you pre-store the names of the film's main actors and swiftly recall them by their first two letters. Press [ok] or [enter], and [jog] to 'TrackName 2', etc.

### Library cleaning

By [jog]-ing past 'TrackName 8' you reach 'Del TrkName', [ok], select the track-name to be deleted, [ok]. If you decide not to delete it, press [esc]. In a bind and no time to name the tracks of the next take, it is better to remove the former take's track-names than to write incorrect ones.



Go to the track-name editing line (any track will do), and press [shift] [esc]; the following generic names will replace them: **T1** to **T8** on native monophonics; **ms-M** and **ms-S** on M/S tracks; **MixRight** and **MixLeft** on mixdown tracks. Press a [track-solo] button to display that track's name in the rectangular screen.

**Note 1:** To allow for a possible entry from a PDA, the generic track-names above are only recorded upon completion of the take.

**Note 2:** The default entry mode is 'overwrite', if you change it by selecting 'insert' on a keyboard, it will revert to 'overwrite' on the tenth character since track-names are limited to this number.

#### 4 Prod TapeRef

The TapeRef (*Production Tape Reference*) overwrites the automatic Cantar generated MMDD *DayStamp* and replaces it with either the incremented "Shoot Day Number" of the project, or something like the VideoTape ID, called the "Roll Number" (see 'Practice 2', p.43).

#### POST-Record Metadata entry

After REC, go back to PPR: the scene, take and filetag to be used for the next file recording is displayed. If you need to modify the previous take's information, press [shift] [silver], the rectangular screen displays EDIT, the PREVIOUS filetag, and the scene and take of the last recorded file. Press [ok] then [>, [<] or [jog] as explained in the preceding paragraphs.

You can modify the take-type (*tpwan*) with the [red] button. Press [ok] to confirm, then [shift] [silver] to close and go back to displaying the NEXT take's characteristics. Scene and take can also be modified later by selecting the file in BROWSE, and performing the same editing operations as described here in PPR.

#### *Pazienza! paciencia! patience!*

When editing metadata entries, you are modifying the native files stored in the internal HDD. If you are working in simultaneous (mirroring) mode, these modifications are immediately applied to the external drive files as well. But if you are working in **IdleCopy** mode, they will only be applied later when Cantar is in TEST or STOP position.

So, at the end of the session, remember to not unplug the external HDD nor to remove the DVD-RAM disk in haste; wait until **IdleCopy** finishes its revamping work!

### File splitting

#### Manual split

To divide a file into shorter segments, quickly go from REC to PPR and back to REC. A new file is created; it carries the same scene ID and the take # is incremented. You will not lose a single audio sample. A short pre-silence is added at the head of the new file to ease the splicing work in Post. By setting the PPR buffer to a long enough duration you can even enter new scene and take IDs and comments.

#### Automatic split

If you need to record audio during very long periods without interruption but you don't want files larger than 4GB, Cantar automatically closes the file and starts a new one: four settings are available: **260MB** (e.g. 1 track for 30 min @ 24-bit/48kHz), **690MB** (700MB CD-R capacity), **2GB** (default setting), **4GB** (FAT32 max. filesize). The filetag is incremented but the scene and take IDs remain the same.

#### Last take erasure

Purposely, Cantar lets you delete the last take only, e.g. a false start or bad remix. In PPR, open 'Edit' by [shift] [silver], select 'Delete Take'; toggle from 'No' to 'Yes'; [ok]. As further protection, the latest position must have been REC, and the power must not have been turned 'OFF'. If you want to erase a complete disk, go to SESSION.04 'Disk Format'.

**note 1:** 'Take' represents a 'file group' sharing the same scene, take and filetag, e.g. CD2234 represents the monophonic files CD2234\_1 to CD2234\_8.

**note 2:** when poly files have been requested, they are created in Cantar's idle state (PPR and TEST), after the recording has stopped.



## Remote Control

### Remote by LTC

This function is also called 'Remote Roll', 'Auto-load' or 'Remote record' depending on the country and manufacturer.

Select AUDIO/TC.13 'Rec by LTC' (p.31): Cantar starts recording upon receiving **running LTC-in** and stops recording upon receiving **frozen LTC-in** generated by a video camera or an Aaton GMT (see 'GMT-u', p.49). Note that the TC which is stamped in the files is Cantar's own TC if set in master '**int c**' or the one carried by the 'remoting' LTC if set in '**ext c**'.

The 'remoting' LTC can carry a continuous *record-run* TC or a discontinuous *free-run* time-of-day TC. No time overlaps are created on the breaks since Cantar waits for 3 seconds to validate the new LTC then goes to REC while splicing the preceding three second audio stored in the pre-record buffer.

If you want to continue the recording knowing the camera is about to stop, swiftly switch from PPR to REC.

### Remote by keyboard

In PPR, Cantar can be controlled by a PS2 **keyboard** through a *USB-PS2 to SubD 15* converter (p.51).

Press [ctrl] [alt] [\*], where [\*] is a letter:

[r] = REC	[g] = IN-GRIDS
[p] = PPR,	[m] = OUT-MAPS
[t] = TEST,	[a] = AUDIO/TC
[s] = STOP	[k] = TECHSET
[l] = PLAY	[c] = BACKUP (Copy)
[b] = BROWSE	[j] = SESSION

Use the vertical arrows or the numeric pad to scroll the parameters, use the horizontal arrows to select the parameter value, press [enter] for 'ok', [escape] for 'esc'.

### Remote by CantaRem or PDA

See **CantaRem** (p.47) and **R.can-w** (p.48).

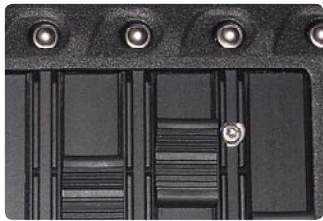


## Recording

In REC, a '● rec' icon is displayed under the active disk drive and a red LED lights up underneath this icon. While in REC, both batteries are paralleled for additional safety.

## Modulometers

In REC, PPR and TEST, the modulometers display the level of the signals to the tracks. The circular modulometers' resolution is 1dB in the -35dBFS to -12dBFS working zone. The rectangular screen modulometers' resolution is 2dB in the same zone. The ballistics emulate needle modulometers. The decay time can be adjusted in TECHSET.12 'Meter Speed' from '1 Fast' to '5 Slow'. In low temperature environment, '5 Slow' is recommended. The default is '3 Med'. The peak-meters are always active, and their 'hold' period can be adjusted from 0.5 to 5 seconds (TECHSET.13).



### Soloing tracks

Pull the [SoloMixPan] slider to Solo (operator side). Press a [track-solo] button, you will hear the track's audio in both ears. While

maintaining pressure on a solo button, press another one. You will hear the first soloed track in the left ear, and the second in the right ear. Use this feature to compare track levels, phases or differential delays.

When a [track-solo] is activated, the selected track's modulometer is differentiated from the others by a 'dashed' appearance.



### Soloing inputs

It is easy to monitor a questionable mic input by rotating the [monitor] crown to So or pressing its [so-fil-tom] (2) button.

## Built-in Mixer

**Pan-pots** Push the [SoloMixPan] slider to PAN (battery side). Each track can be sent to the left or right tracks of the mixdown. Press the [track-solo] button and [jog] the marker to the left or the right of the circular screen. When it is in the center it provides a mono mix. The value in dBFS of what is left to the other side is displayed on the rectangular screen. When a track pair is declared 'M/S', the pan goes to the



middle and it is L/R decoded into the mix. If you create a Phone-out or Line-out monitor configuration out of an M/S declared pair, you will get pure stereo.

If you pan the M track to one side or the other, it goes 100% to the right or left, and the S signal disappears from the mix. That is the way to mono monitor an M/S pair.

**Mixer Sliders** Once the pan-pots have been set, each track's contribution to the mix is adjusted with the mixer's sliders. The maximum gain can be either +6dBu or 0dBu (AUDIO/TC.07 'MixGain Max'). To listen to the mixdown, set the [monitor] crown to Ph and [jog] to 'Ph MX'.

**Mixer Bargraphs** The mixer Xa · Xb outputs, when recorded on tracks T7 T8, appear on the rectangular screen top



row. dBFS values: -50 -45 -40 -38 -36 -34 -32 -30 -28 -26 -24 -22 -20 -18 -16 -14 -12 -9 -6 -3 .0 .Clip.

[jog] overwrites the bargraphs with the battery

voltage, the available disk space, and the remaining recording time, calculated from the current track count, bit-depth and sample rate.

**note:** pressing the [eye] button toggles display of T5 T6 or T7 T8 on the right modulometer.

## Reference Tone generator

In TEST, PPR or REC, [shift] [red] sends a 1kHz tone to the tracks, modulometers and Xa · Xb mixdown. '-18dBFS' or '-20dBFS' can be selected in AUDIO/TC.03 'Tone Level'. Releasing [shift] before [red] locks the tone 'ON'; activating [shift], turns it 'OFF'.

## Talkback mic

In TEST, PPR or REC, press and hold the [black] button to send the talkback to the left channel (see AUDIO/TC.04 'TalkbackMic'); quickly press [black] then press and hold it to send the talkback to the right channel. Press [shift] [black] to send the talkback to all tracks.



### Warning beeps

The beep level is set in TECHSET.11 'Beep Level'. **One beep:** record start (05), clip detection (06). **Two beeps:** record stop or low priority problem such as low battery voltage; the 'Lack of external clock' (07) is automatically disabled on 'w' (wild track) takes. **Three beeps:** high priority problem, e.g. unplugged external HDD.

### Headphone level

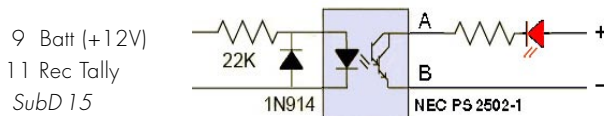
The headphone level is protected by [shift] and is displayed on the rectangular screen. Rotating the fader makes '<' and '>' appear. There is no level change if [shift] re-activation is done when the fader is put back in its 'pipe' (| |) position.

### Take-type

While in PPR or REC, press the [red] button to toggle the take-type: t=time sync audio, p=pick-up, w=wild track, a=announce, n=no good. Remember: '**t p w a n**'.

### Record tally

In REC, the SubD 15 pin-11 is grounded by an open collector transistor (max: 40mA). *Do NOT use a coil activated device on pin 11, the flyback voltage would kill the transistor.* Use an opto-coupler (see drawing) to avoid ground loops.



### AutoSlate

In AUDIO/TC.12, select the slate detection channel.

**While in REC**, press [shift] [silver] *within six seconds* after a clapstick; the most plosive event preceding [shift] [silver] creates a Slate Mark. The successive slates generated by a multicamera shoot are labeled SA, SB... SG. The clapstick quality is displayed in the rectangular screen, 25% should be a minimum; at 75% score, you can congratulate the slateman! If you forget to press [shift] [silver], AutoSlate detects the most plosive sound of the take with a 95% chance of selecting the clapstick; in this case the Sound-Report's Slate-TC appears in '*italic*' to show it must be either confirmed or ignored.

**While in PLAY**, [shift] [silver] starts the playback at the slate-marks. Majax displays an upright slate icon on start-slates and a bottom-up icon on tail-slates; click the icon to listen to the slate announce.

### Markers

Press the [silver] button to create UserMarks labeled UM1, UM2... UM10 on wind clicks, boom noise, dialogue slip, etc..  
**While in PLAY** they are accessible with the [silver] button.

### Rec&Play

*first, read p.44 & p.45*

As explained in the tutorial, two recording modes, Live and Clone, are available:

**Live (Playback, ADR1):** in BLUE-REC, the analog inputs are recorded in the standard way. To launch the first playcard, press [ok] (or [space] if you are using a keyboard). To stop before reaching the cue-out, press [ok]. To replay from the cue-in, press [ok]. To pause, press [esc], to resume, press [esc]. To reach other cards, two methods are possible: • the bare bone where [shift] [>] browses the play-files, and [>] the play-cards. • the easiest: connect a PS2 keyboard and type the card IDs (B12, F45, A08), then [enter]. See Tarkan (p.46).

**Clone (Remix, ADR2, Re-rec):** as soon as BLUE-REC starts, the BLUE-TEST last selected play-card is instantly played. To abort the 'cloning', go to PPR, delete the file (see *Last take erasure*, p.19) and return to BLUE-REC to redo it. It is possible to record live audio after the end point of the master file but this generates a longer cloned file at the risk of timecode overlapping with the next take.

**note:** Rec&Play only works at 48kHz ( $\pm 0.1\%$ ). If there is a discrepancy between the play-file sample rate and the Cantar recording sample rate, a 'PF-47952Hz/Rec-48000Hz' message is displayed. You can nevertheless proceed to BLUE-REC: the playback files will be played at the 'Live' recording sample rate, inducing a speed change which can be quite useful on filmed music shows transferred to NTSC.

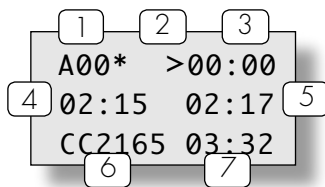


## Commands

[ok]	starts/stops&sends to cue-in
[shift] [ok]	displays digitization parameters and TC fps
[<] [>]	go to prev/next play-card (or file if no card)
[shift] [<] [>]	go to the prev/next play-file
[esc]	play pause/resume
[shift] [esc]	toggles continuous file to file play (PLAY only)
[black]	cue-in, volatile in PLAY
[shift] [black]	sends player to start of take
[red]	cue-out in BLUEPLAY; erases cues [jog]ed to 00:00
[shift] [red]	hides play-card from Rec&Play list
[silver]	sends player to record-entered markers
[shift] [silver]	sends player to AutoSlate marks
[jog]	scrubs audio
[shift] [jog]	accelerates scrub 10 x
[eye]	toggles tracks 5/6 vs. 7/8 on right screen
[shift] [eye]	toggles filetag&duration vs. scene&take (stored pref. until Cantar is turned 'OFF'). N.A. in BLUEPLAY.
[TC jam]	toggles player's relative time with absolute TC

## Rectangular screen

- 1 A01 play-card label; \* hidden from Rec&Play list.
- 2 > normal speed; ||> pause; -> non-stop play; 'm1' user record marker; 'sA' autoslate marker; ■ stop (end of file).



- 3 cue-in (volatile in PLAY).
- 4 scrub position [jog].
- 5 player pos. or absolute TC.
- 6 filetag (or scene [shift][eye]).
- 7 cue-out (or take [shift][eye]).

### notes:

- the displayed mm:ss time is relative to the start of file, the file absolute TC appears by pressing [TC jam].
- in PLAY and X00 (1), the cuein (3) is volatile, i.e. not stored when exiting; the outpoint (7) is the end of file, i.e. the duration.
- in scrub, each [jog] tick moves the player by one second, delivering very intelligible forward and reverse dialogue.
- to edit 'scene & take' entries, scrub over the autoslate mark, listen to the announce, then go to BROWSE.
- to read the size of one track of a group, go to BROWSE.
- the LTC output carries the TC & fps of the play-file, not the project TC, it can be used to slave a chasing VTR.

**Reminder:** when going to PLAY or BLUE-PLAY, take your time while passing over STOP; if the message 'you were too fast' appears, go back to STOP for one second.

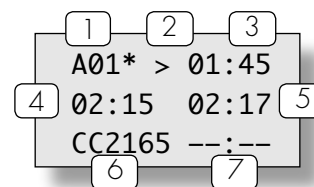
## Play-card creation

read p.44 & p.45

1- In BLUE-PLAY, with [shift] [>], choose a playfile among indexes **A to L**, the file index is displayed in (1).

2- With [>] or [<], select a card, e.g. **A01... A51**, among the available fifty-one empty cards per file. The factory **A00** card contains the entire playfile, it does not store a cue-in, and its cue-out (7) is always the take end, i.e. its duration.

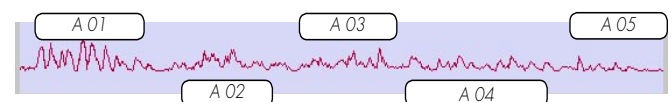
3- To fill an empty card, scrub the audio with the [jog] (4), press the [black] button to set a cue-in (3), scrub further and press the



[red] button to set a cue-out (7); a half second silence is inserted at the cue-out to let you detect and fine tune its position. The last entered cue points replace the former ones.

Once a cue-in has been entered (a cue-out is not necessary), an empty card becomes a **play-card**. The cue points are stored in the iXML chunk of the file and will only be removed if you erase the playcard; to do so, [jog] to 00:00 and press [red].

To **hide** a play-card without erasing its cues, press [shift] [red]. Tagged with a '\*' character, the card is no longer visible in the BLUE-TEST/BLUE-REC play list, shortening it.



Playfile 'A' from the current project containing five play-cards. Note their chronological placement, suitable for an ADR session.



Playfile 'E' from the archives, six play-cards (E34 hidden). Note their free and overlapping placement, suitable for classic playback.

4- With [>] select a play-card and press [ok] to play it from its cue-in. If there is no cue-out in this card or if you want to stop the playback before reaching the cue-out, press [ok]. Press [ok] again to restart from the cue-in. Press [esc] to pause, press [esc] to resume play.

**note:** Cantar is the fastest playback machine around, there is **NO latency** between 'play' and the audio output.



## Edit metadata

**Find a file** BROWSE opens access to the *Internal HDD* and *Current Project* files. To get access to files located on an external drive and in another Project, you must first go to SESSION.03 and select 'Ext.HDD', then select the project in SESSION.01 'ProjectName', and return to BROWSE.

Select a *Day* by [jog] & [ok], the last take's *filetag* is displayed; search other filetags by [jog], press [ok] on the one to be edited and/or played. The displayed 'MB' is the size of *only one* of the tracks of the group.

**Edit the file** Edit the scene, take, comments and track-names as you do in PPR 'Metadata', (p.18). The [red] button toggles the take-type (t p w a n). Note that file editing can also be done from the 'browse' position of R-can-w (p.48).

**Wake-up HDD** When Cantar is left on STOP, the HDD goes to sleep after the time interval set in TECHSET.16; when going to REC, waking it is not a problem because the pre-record buffer hides the disk spin-up, but going directly to BLUE-BROWSE makes the rectangular screen display: 'asleep, no disk', then 'back & forth' (this can make the play-files inaccessible (No)). To wake up the disk, go to TEST and wait for the 'three-platter' icon to show up, then go to BLUE-BRWS.

## Indexing the 'Play-files' read p.44 & p.45

In BLUE-BRWS.01 to 20, put the files you need under indexes **A to L** which converts them into *play-files*.

- **A B** are reserved for the *current day* of the *current project*
- **C D E F** are reserved for *any day* of the *current project*
- **G H I J K L** are reserved for *archives*, e.g. wild tracks, music, etc., stored on external or internal HDDs (see note).

BLUE-BRWS 08
Index D <
SE1104 hide

To lighten the Rec&Play navigation, it is wise to toggle from **view** to **hide** the play-files not needed immediately; to do so, use [esc] instead of [ok] to exit from the file selection row.

BLUE-BRWS 21
TC mode <
Clone (x)

In BLUE-BRWS.21 'TC mode', **Live (all)** gives access to *all visible play-files*, and causes the recording session to work under the current date, time and metadata of the *live recording*. **Clone (x)** gives access to *play-file x only*, and changes it to '**view**' whatever its previous state. The recording session will use the date, time and metadata of *this play-file*.

## Current folders

BLUE-BRWS 01 Drive Internal	Current Drive set in SESSION (not modifiable)
BLUE-BRWS 02 Project Shadows	Current Project set in SESSION (not modifiable)
BLUE-BRWS 03 (AB)folder 2008-03-14	Current folder date (not modifiable)
BLUE-BRWS 04 Index A < SE1234 view	Select a file in above folder [ok] gives it the A index
BLUE-BRWS 05 Index B < SE1205 view	Select a file in above folder [ok] gives it the B index
BLUE-BRWS 06 (CD)folder < 2008-01-31	Select a folder date from the project
BLUE-BRWS 07 Index C < -----	Select a file in above folder [ok] gives it the C index
BLUE-BRWS 08 Index D < SE1104 view	Select a file from the folder [ok] gives it the D index
BLUE-BRWS 09 (EF)folder < 2007-12-24	Select a folder date from the project
BLUE-BRWS 10 Index E < SE0987 view	Select a file in above folder [ok] gives it the E index
BLUE-BRWS 11 Index F < SE0980 hide	Select a file in the folder [ok] gives it the F index

## Archive folder

BLUE-BRWS 12 Arch Drive < External
BLUE-BRWS 13 Arch Pject < NeuArchv
BLUE-BRWS 14 Arch folder< 2000-01-01
BLUE-BRWS 15 Index G < SE1234 view
BLUE-BRWS 16 Index H SE1205 hide
BLUE-BRWS 17 Index I < SE1205 hide
BLUE-BRWS 18 Index J < SE1104 view
BLUE-BRWS 19 Index K < ----- hide
BLUE-BRWS 20 Index L < SE0980 view
BLUE-BRWS 21 TC mode < Clone (D)
BLUE-BRWS 21 TC mode < Live (all)

**note1:** an **Archive folder** is a 'One drive, one project, one arbitrary date' folder containing files in which the metadata is stored under iXML v1.50a, i.e. recorded on a Cantar v2.11 or later.

**note2:** to **update** old style BWF archives, Clone them using in-grid RR9 (p.17). To **convert** MP3 programs to BWF, record them through Cantar's analog inputs under the 'Otc' mode to give them a TC.

**note3:** for Rec&Play to index a file, first move it (with Majax) into a 'Folder' of the 'Current project' or into the 'Archive folder'.



## MainSelector East positions

The MainSelector, easy to manipulate even with heavy winter gloves, gives direct access to all essential functions.

The OPERAND positions establish Cantar's operating parameters with no deep diving into sub-menus.

IN-GRIDS	'inputs to tracks' grids.	(5h)
OUT-MAPS	'outputs monitoring' maps.	(6h)
AUDIO/TC	settings showing in the audio files and TC signals.	(4h)
TECHSET	settings for day-in day-out use.	(3h)
SESSION	projects, disks and Sound-Report.	(2h)
BACKUP	archiving audio files.	(1h)

## MainSelector buttons

IN-GRIDS and OUT-MAPS positions

• [black] creates a link • [red] removes a link.

## Rectangular screen rows

Operands are displayed in a way which always indicates their path-tree. Parameters' labels and values are browsed by

AUDIO/TC 01  
SampleRate  
48048

[jog] and/or [>] [<] arrows.

• Top row : Operand, Parameter #

• Middle row : Parameter Label

• Bottom row : Parameter Value

## IN-GRIDS

p.26

### AUDIO/TC

p.30

- 01 Sample rate
- 02 Bit-depth
- 03 Ref. tone level
- 04 Talkback mic
- 05 Line-out level 06 Foldback level
- 07 Mixer gain max

### TECHSET

p.32

- 01 Disk (un)mount
- 02 Digi in/out power\*
- 03/04 Save/Load Setup
- 05 Backlight
- 06 View Fader dB
- 07 Record beeps

### SESSION

p.35

- 01/02 Select/Create Project
- 03 HDD in Use

### BACKUP

p.38

- 01 Save mode
- 02 Day to copy
- 03 Track selection

## OUT-MAPS

p.28

- 08 Pre-record duration
- 09 Balance fader lock
- 10 Mic fader links
- 11 Sc&Take template
- 12 AutoSlate channel
- 13 Record by LTC
- 14 TC source

- 08 Clip detection beep
- 09 Lack of ext. clock beep
- 10/11 Beep routing/level
- 12 Meter speed
- 13 Peak hold duration
- 14/15 BatL/BatR alert
- 16 HDD Power Down

- 04 HDD & DVD format
- 05 Scan disk
- 06 Delete-file access

- 04/05 T1-Tx T7T8 treatment
- 06 Media type
- 07 Burn and check
- 08 Files to copy

- 15 LTC rate
- 16 LTC gen. output
- 17 LTC User-bits
- 18 Rec-Run 19 Operator TC init
- 20 Digi 1-6 Out-maps
- 21 CantaRem com
- 22-29 CantaRem assign

- 17 Serial Com. port
- 18 Factory Reset
- 19 Max File Size
- 20 Temperature Control
- 21/22 System Time/Date
- 23/24 Equipmt IDs/License key
- 25/26 Software version/Load

- 07 to 13 Sound-Report headers
- 14 Column layout selection
- 15 to 29 A-Columns 02 to 16

- 09/10 File name/Media label
- 11/12 Snap/Idle Sound-Report
- 13 Clean Poly files
- 14 Run Backup

\* was in AUDIO/TC.21



## Routing inputs to tracks

Cantar records eight independent monophonic tracks; physically identical, they are separated into two groups: T1 to T6 and T7 T8.

## Tracks T1 to T6

The *In-grids* routings and signal levels of the T1 T2, T3 T4 and T5 T6 track pairs are displayed on the circular screens.

These tracks receive any one of the active inputs: Line-in 1 to 4, Mic 1 to 5 and 'AES' Digi 1 to 6.

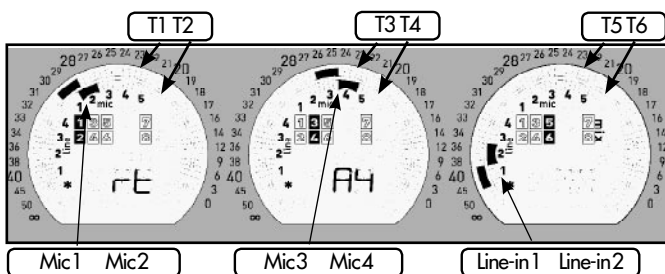
## T1-T6 In-grid creation

Fifteen routing templates (called *In-grids*) can be created and stored in three groups: A1 to A5, B1 to B5, C1 to C5. Their IDs are displayed on the central circular screen.

The [config] crown gives sequential access to all of them in a wink; the last configuration in use is displayed. Select the configuration to be modified, a blinking cursor awaits your orders near the '\*' icon of the left circular screen.

For the learning process, it is easier to create a configuration from scratch: **first erase an existing one** by pressing the [red] button while [jog]-ing through the three circular screens.

**Example:** to route Mic 1 to Track 1, [jog] five positions up and put the blinking cursor facing the mic segment '1' then press the [black] button to accept it; to route Line-in 1 to Track 5, [jog] the cursor through Tracks 2, 3, and 4 until



you land on Track 5 (odd tracks are on the outer circle, even tracks on the inner circle). Go to the pixel opposite Line-in 1, accept with the [black] button; reject with the [red] button.



remote touch-screen and keyboard



Bluetooth

9 analog inputs to 9 permanently active rotary faders (no trims)



Input pairs (p.27)

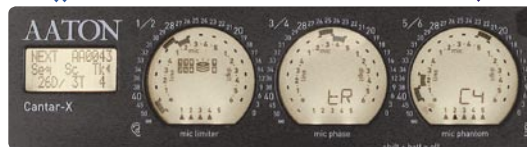
6 pan-pots and 6 mix faders



mixer

fifteen channels (9 analog, AES 1 to 6 routed to T1-T6 (p.26).

T7 T8 on 2 linear modulometers (p.8)



T1-T6 on 6 circular modulometers

monophonic 8 tracks

**note:** As soon as an AES Digi-input is selected in a routing configuration, the Digi 1-6 input icons start flashing to remind you to turn the digital power 'ON'. AES in/out converters consume 110mA at 48kHz and 200mA at 96kHz, it is wise to turn them 'OFF' if they are not in use (see AES power end of this chapter and TECKSET.02 'Digi in/out power').

## T1-T6 in-grid check and select

In REC, you can silently check the active *In-grid*: **PUSH** the [Solo/MixPan] slider to the battery side, and press the [routing] button.

While in REC, for the protection of the recording's integrity, you can't select another configuration but you can nevertheless do it on purpose: go to PPR, press the [routing] button, rotate the [config] crown to select a new configuration and go back to REC, the pre-record buffer gives you up to 35 seconds to act... not one single audio sample will be lost between the two audio files.



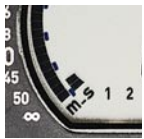
### Instant (dis)arming

Monophonic files don't waste space by recording empty tracks as is the case with polyphonic files. It is wise to momentarily disarm a track when there is no use for it. Go to TEST, press [shift] [track-solo] of the unwanted track. Its monitor is muted, and to remind you this track is disarmed, its track number square icon is blinking and its modulometer is dashed to make it less visible but still usable.

Disarmed tracks are not rearmed by passing through STOP, you must pass over IN-GRIDS, or turn 'OFF' the power.

### M/S Declaration

If two tracks carry an M/S pair entered on say Mic3 and Mic4, use the [black] button to activate the 'm-s' icon attached to these two tracks while passing over it (see pic.). The suffix of the files carrying M/S tracks will show a hyphen '-' instead of an underscore '\_'.



(Titan3, the auto-conforming tool (p.50), must carry the cantar.tsc file to handle the hyphen flagged suffixes).

Being M/S declared, these files are monitored as L/R stereo tracks in the monitor outputs and in the mixdown (see 'Pan-pots', p.21). Majax (p.50) can decode and replace M/S pairs with L/R pairs for export to editing machines (e.g. Avid) which can't decode M/S stereo.

### Tracks T7 T8

Originally devoted to the recording of the mixdown, these two tracks are handled in a specific way. The T7 T8 signal levels are displayed on the rectangular screen bargraphs and on the right circular screen by pressing the [eye] button.

IN-GRIDS	
T7	T8
Mic5	Xb

### T7 T8 In-grid creation

While the MainSelector is on IN-GRIDS, the T7 T8 in-grids are displayed on the rectangular screen. They are independent of the T1-T6 banks. Pressing the [ok] button makes the [jog] scroll through the following configuration pairs:

(01)None None (02)Xa Xb (03)Mic1 Xb .. (07)Mic5 Xb  
 (08)Line1 Xb .. (11)Line4 Xb (12)Digi1 Xb .. (19)Digi8 Xb  
 (20)Mic1 Mic2 (21)Mic3 Mic4 (22)Line1 Line2  
 (23)Line3 Line4 (24)Digi1 Digi2 (25)Digi3 Digi4  
 (26)Digi5 Digi6 (27)Digi7 Digi8 (28)Digi7 Mic5

It is not possible to MS declare a T7 T8 track pair.

- **None:** tracks T7 T8 are disarmed, saving disk space.
- **Xa and Xb:** the mixdown of T1 – T6 is sent to T7 T8; a 'mix' icon appears in the left circular screen.
- **Any input and Xb:** one input (Mic, Line-in or Digi-in) goes to T7, the T1 – T6 mixdown auto pan-potted to Xb, goes to T8.
- **Any input pair:** one input pair (Mic, Line-in or Digi-in) goes to T7 T8.

### T7 T8 in-grid check

In REC, you can silently check the active *in-grid*: **PUSH** the [SoloMixPan] slider to the battery side, and press the [routing] button; the active T7 T8 in-grid appears on the rectangular screen.

It is not possible to disarm a T7 T8 track on-the-fly.

### Sixteen Tracks

(two Cantar-X2s)

To impose the very same sampling rate frequency and phase on two *recorders operating in parallel* like one single sixteen track machine, enter a **Wordclock** signal on the SubD 15 Pin-4, and select a 'WC' prefixed sampling rate in AUDIO/TC.01 'Sample Rate'. If you select the wrong sampling rate, 'Wordclock SampleRate mismatch' is displayed on the rectangular screen. If the Wordclock reference is missing, 'Wordclock input missing' is displayed.

### Digi power

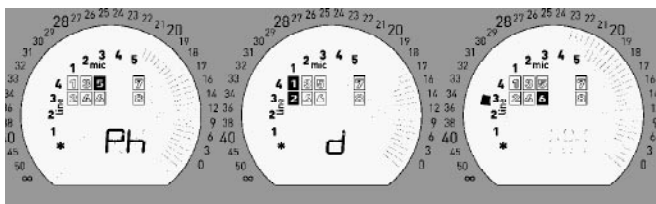
The AES sample converters of the Digi-in/out circuits consume 110mA at 48kHz and 200mA at 96kHz. It is wise to turn them 'OFF' if they are not in use (TECHSET.02 'Digi in/out power'). As soon as you select a Digi-input or Digi-output in a routing configuration, the Digi 1 to Digi6 input icons and the track icons start flashing in the circular screens to remind you to turn 'ON' the digital power.

The **Sample Rate Converters** translate any incoming AES sample rate, e.g. 44.1kHz; to the Cantar internal sample rate, e.g. 48048Hz.

So Solos for the phones  
Ph Phones pair,  
Fb Foldback pair  
Lo Line-out pair  
Do Digi7/8 output pair  
Digi1-6 (AUDIO/TC.20)

## The 3 Screen map

Here is where the Cantar three screen lay-out is at its best. Audio signals going to the left ear are displayed on the left screen, signals to be listened to in mono are displayed on the middle screen, and those going to the right ear are displayed on the right. The middle screen does not represent a wired output but the 'mono' effect resulting from the routing to both the left and right outputs.



• Track T5 goes to the left, T1 & T2 go to both sides (mono listening), T6 goes to the right. • Line-in 3 goes to the right.

## Map creation

Grouped in banks accessible from the black [monitor] crown, twenty six *Out-maps* are stored for the Digi-out, Foldback, Line-out, and Phones. The eight tracks, nine analog inputs and six digi-inputs (recorded or not) are independently routed to these output channels.

Since each of them carries a left and right channel, they are managed in the same manor. The explanation below concerns the headphones, and is applicable to the others as well.

### • Tracks to outputs "Ph.d" example

Rotate the [monitor] crown to **Ph**. 'Ph' appears on the left circular screen. Rotate the [config] crown to get 'd' on the middle circular screen. The black blinking cursor pinpoints an audio source.

[jog] the blinking cursor to the T5 square on the left circular screen, press the [black]\* button to 'link' Track5 to the headphones left side, the blinking frequency increases to acknowledge the link.

[jog] to T1 on the middle circular screen, press the [black] button to link Track 1 to both the left and right sides of the headphones (do the same for T2).

[jog] to T6 on the right circular screen, press the [black] button to link Track6 to the right side of the headphones.

\* press the [red] button to 'unlink'.



### • Inputs to outputs

Any input, even if it is not routed to a track, can be directly routed to the monitor outputs. While the blinking black cursor runs on the inner ring of the circular screen, it points out the input (Mic 1 to Mic5, Line-in 1 to Line-in4, Digi-in 1 to Digi-in 6) to be possibly routed to the left/both/right ears. [jog] the cursor throughout the ring and 'link' the facing input to an 'ear' by pressing the [black] button.

## The monitor crown

Rotate the [monitor] crown over the **Do**, **Fb**, **Lo**, **Ph** positions, and rotate the silver [config] crown over 'MX, A, B, to Z': all the stored *Out-maps* are instantly accessible (p.7).

### Do Digi7 8-out

Mx, R to Z

Mx (Xa Xb) and nine user created R to Z maps. The digital pair goes to AES ports 7&8.

### Fb Foldback

Mx, R to Z

Mx (Xa Xb) and nine user created R to Z maps. The level of this analog pair is set in AUDIO/TC.06, or by a CantarRem slider, or in TEST [shift][silver] LVL&DELAY.02.'Foldbck Lvl'

### Lo Line-out

Mx, R to Z

Mx (Xa Xb) and nine user created R to Z maps. The level of this analog pair can be set in AUDIO/TC.05, or by a CantarRem slider, or in TEST [shift][silver] LVL&DELAY.01.'Lineout Lvl'

### Ph Phones

Mx, Mc, A to Q

Mx (Xa Xb) is the stereo dynamic output of the mixer, it remains a stereo dynamic mix of the T1 -T6 tracks in the PLAY position too. Fifteen user created A to Q maps. The 'mono' Mc position is the sum of Xa Xb.

### So Solos

M1... M5, L1... L4, d1... d8.

This pre-mapped position opens a direct phone connection to all of Cantar's in and out ports.



## Digi outputs 1 to 8

The use of the AES outputs is recommended to send audio signals to the external world: total transparency, no interference prone cables.

Connect them to HD video cameras featuring AES inputs (such as the Sony HD-Cam F900-SR), or to an SDI camera equipped with a miniature AES-to-Analog converter.

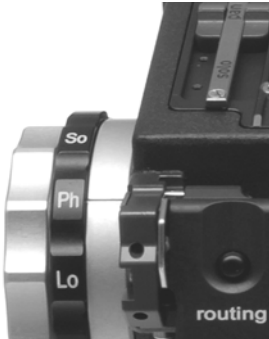
The eight AES outputs are separated into two groups.

- the **Digi 1 2, 3 4, 5 6 pairs** transmit either
  - **Tracks T1–T6**
  - **Mics 1-5 & Line-in 1**

This later option lets you use the Cantar's high quality pre-amplifiers/limiters to send audio signals to an external mixer and re-enter them through the Digi 1 to Digi 6 inputs to record them. (see AUDIO/TC.20 'Digi 1-6 Out-maps').

- the **Digi 7 8 pair** transmits either
  - **Tracks T7 T8**
  - any other audio signal combination, including the mix-down, as selected in **Do** (see previous page).

## Check / Select a monitor map



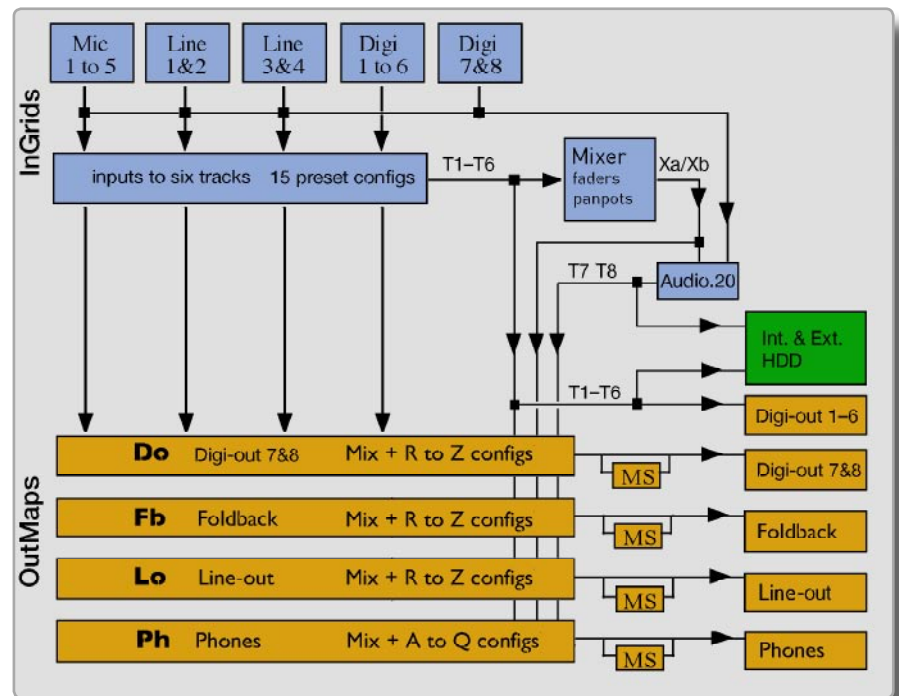
**Check:** in TEST, PPR and REC, with the **[SoloMixPan]** slider pulled-Out (see 'verbatim' below), press the **[routing]** button with the thumb and rotate the black **[monitor]** crown to check the currently active **Out-maps** of each monitor output displayed on the three circular screens.

**Select:** to on-the-fly select a different **Out-map**, while on a given monitor output, rotate the silver **[config]** crown to browse the available ones. The active map is the one displayed when releasing the **[routing]** button. In REC, selecting a different **Out-map** doesn't affect the integrity of the recording.

## Verbatim

Cantar only uses the Solo and Pan positions of the **[SoloMixPan]** three position slider; here is a memotechnic method to help you memorize its position for routing purposes.

- Pushing the slider toward the **mic inputs** allows changes to the **inputs to tracks In-grids**.
- Pulling the slider toward the **operator ears** allows changes to the **monitoring Out-maps**.





## AUDIO/TC

01 Sample rate	12 AutoSlate channel
02 Bit-depth	13 Record by LTC
03 Ref. tone level	14 TC source
04 Talkback mic routing	15 LTC rate
05/06 Line-out/Foldback level	16 LTC gen. output
07 Mixer gain max	17 LTC User-bits
08 Pre-record duration	18 Rec-Run TC init
09 Balance fader lock	19 Operator TC init
10 Mic fader links	20 Digi 1-6 Out-maps
11 Sc&Take template	21 CantaRem com
	22-31 CantaRem assign

### 01 Sample Rate

44100 47952 48000 48048  
88200 95904 96000 96096

For Wordclock slaving (Cantar-X2 only), select the WC prefixed values, e.g. WC 48000, which are the same as the non-WC rates (see 'Sixteen Tracks', p.27).

### 02 Bit Depth

16-bit 24-bit

Select 16-bit if you know the final mix will be done in 16-bit. Dither or truncate to 16-bit from native 24-bit tracks is available when backing-up the mixdown. See BACKUP.05 'T7 T8 Trmt' (p.39).

### 03 Tone Level

-20dBFS -18dBFS Off

See 'Reference Tone generator' (p.22).

### 04 TalkbackMic

Off Line-out Foldback Lo+Fb

[black] continuous: TB mic to *left* channel(s),  
[black] then [black] continuous: TB mic to *right* channel(s),  
[shift] [black] continuous: in REC, TB mic to all tracks.

### 05 Lineout Lvl

0 to -94dB Mute

The Line-out level is [jog] adjustable from 0 to -94dB and mute. The track modulometer being at 0dBFS, the Line-out delivers a +8dBu signal; this means that a -18dBFS reference tone delivers a -10dBu output.

This is compatible with HD camera Line-in levels. A Line-out, two track, +12dBu gain, transformer-isolated accessory is available (p.51).

### 06 Foldbck Lvl

0 to -94dB Mute

Both Line-out and Foldback gains can be controlled from the CantaRem sliders (p.47).

### 07 MixGain Max

0dB +6dB

In +6dB mode, the 0dB mark is on the indentation.

### 08 PreRec Dur

1 to 35 sec.

Up to 35 seconds @ 8 tracks, 24-bit, 48kHz.

Up to 17 seconds @ 8 tracks, 24-bit, 96kHz.

### 09 BalanceLock

Unlocked Locked

Slaved fader status, see 'Mic Coupling' p.17.

### 10 Mic Links

1>2 3>4 1>2+3 1>2+3+4 1>2+3+4+5 5>4+3\*

These are the mic-preamp ganging groups. The factory default is '1>2 3>4', it can be (de)activated with the button in-between the faders. The master fader is to the left of ">", the other(s) control the  $\pm 12$ dBu balance.

\*Made for 'double MS' (p.42) this will come with v2.1x.

### 11 ScTk Templt

nnnA/nnA.nn CCCCCCCC.CC

The nnnA/nnA.nn template fits the mostly used Sequence/Scene system. The other one is totally open, giving the operator maximum flexibility ('Scene and Take', p.18).

### 12 Slate Chanl

Off Mic 1... Mic 5

Line-in 1... Line-in 4 Track 1... Track 8 (Cantar-X2 only)

See AutoSlate detection, p.22.





## 13 Rec by LTC

see *Remote Roll*, p.20

Inactive Active

In PPR, LTC input running, Cantar checks the TC coherence for 3 seconds then goes to record. While checking the validity of the LTC signal, the audio is kept in a buffer, the audio file begins right on the running LTC. Frozen LTC input stops recording. If the LTC input disappears, recording is maintained, no risk of interruption caused by radio transmission drop-outs.

## 14 TC Source

Int.Clock Ext.Clock

On 'Internal Clock', Cantar is **THE** master-clock. On 'External Clock', it is slaved to another timecode source (p.14).

## 15 LTC Rate

24FPS 25FPS 29.97DF 30FPS 23.98NDF-A  
29.97NDF-A 23.98NDF-B 29.97NDF-B 23.98NDF-C  
29.97NDF-C

In the -0.1% NTSC slow-second world, an A, B or C time stamping method must be selected depending on the type of editing machine that will be used (p.15).

## 16 LTC Gen Out

On Off

Note that in PLAY the LTC output carries the TC and fps of the played files, not the project time and frame-rate.

## 17 LTC Ubits

Date Filetag TapeRef Freeform

Filetag, TapeRef, and Freeform entries are not enabled.

## 18 RecRun Init

01h00m00s

Time jumps one hour at each rectangular screen bottom line opening. 'Rtc' (record-run) is activated for the recording session and stays there until another TC Source is selected; in this case the clock goes back to its default free-run mode.

## 19 OperTc Init

01h00m00s

The operator entered TC becomes the next recording session time reference. 'Otc' is displayed in the rectangular screen. It is disabled as soon as free-run TC from an external source jams the internal clock.

## 20 Digi 1-6 Out

T1-T6 Mic1-5+Lin1

On top of their individual routings set in IN-GRIDS, the Mic 1 to Mic5 plus the Line-in 1 signals can be sent to the Digi1-6 outputs. After treatment by a digital mixer/router, they may be sent back to Cantar and routed as standard Digi-inputs.

## 21 CantaRemCom

Inactive Active Forced

'Active' makes CantaRem (p.47) control Cantar until its cable is disconnected from the SubD15 ASCII port. 'Forced' allows CantaRem to control the STOP, TEST, PPR and REC functions when the MainSelector is physically set to the PPR position.

AUDIO/TC 24  
Slider A3  
Line-in 1&2

## 22 Slider A1

## 29 Slider A8

The assignment of the CantaRem sliders to the Mic and Line-in faders, to the mixdown sliders, plus the Line-out and Foldback outputs can be performed from either the CantaRem keys or from these positions (extended out to '30 Slider B1' to '37 Slider B8' when using two CantaRems).



01 Disk (un)mount	14/15 Bat L/Bat R alert
02 Digi in/out power	16 HDD Power Down
03/04 Save/Load Setup	17 Serial Com. port
05 Backlight	18 Factory Reset
06 View Fader dB	19 Max File Size
07 Record beeps	20 Temperature Control
08 Clip detection beep	21/22 System Time/Date
09 Lack of ext. clock beep	23 Equipment IDs
10/11 Beep routing/level	24 License key
12 Meter ballistics	25 Software version info
13 Peak hold duration	26 Software install

## 01 Disk Status

Unmount Mount

*Two CPUs can't simultaneously control Cantar's drives.*

Unmounting the internal HDD and DVD-RAM drives puts them out of the control of Cantar's CPU while keeping them powered. A Firewire connected PC or Mac can then see them as standard devices on which to edit the audio files and transfer software updates.

Using a Mac laptop you must install 'WriteUDF' to be able to modify the metadata on a DVD-RAM disk in the Cantar burner (see Majax Q/A, p.50).

**WARNING:** before disconnecting the Firewire cable, FIRST, eliminate the 'disc' icon from the PC or Mac desktop, THEN disconnect the cable. Ignoring this rule will trigger a warning message, but it will be too late; the audio files may already be corrupted.



MAC-OS



Ejecting the Cantar Disk

WINDOWS

## 02 Digi Power

Off On Digi Loop (Sept. 2008)

'Off' saves 110mA. Routed but not powered, the Digi 1 to Digi 6 icons of the circular screens blink as a reminder to turn 'On' the Digi-in/out sample rate converters.

'Digi Loop' will trigger the powering of the AES converters and disables the internal direct connection from the playback tracks to the Digi-inputs when using the 'AES Level & Delay' accessory.

## 03 Save Setup

(user's settings)

No Yes

All of Cantar's physical settings (IN-GRIDS, OUT-MAPS, TECHSET and AUDIO/TC parameters, mic filters, etc.) are saved in XML files on the external HDD (or the internal HDD if there is no external drive connected). To automatically ensure the uniqueness of the Setup files, each one is named by the filetag of the last recorded take, e.g. AB1234+A.xml. As many Setups as desired can be saved, keep them for later use in the internal HDD. Copy them onto a laptop before returning your Cantar to the rental house. Next time you rent a Cantar, you can re-import those Setups and be ready to go, a great timesaving operation!

And think about the time you spent setting the RR1 to RR8 re-recording in-grids, save them for ever!

**note1:** setups can be viewed (but not modified) on an internet browser; provided you keep the .xml suffix, you can replace the 'filetag-made' name with a more descriptive one.

**note2:** if you encounter an operational problem, immediately perform a 'Save Setup' and send it to cantar-support@aaton.com as an attachment to your mail explaining the problem; this will help maintenance engineers provide you with a solution.

## 04 Load Setup

No Yes

Open the 'Load Setup' screen, [ok]. Cantar first looks for XML files in the external HDD. Select the file you want to load, [ok]. Press [shift] to reboot.

## 05 Backlight

0% to 100%

In bright sunlight, save power by turning off the backlight. To insure visibility whatever the startup lighting environment, the rectangular screen doesn't go down to 0%, this offset is maintained throughout the adjustment range.

## 06 Display dB

On Off

While adjusting a fader, its dBFS value is displayed with the other faders found in the same Mic, Line-in or Mixer bank.



## 07 Record Beep

None Start only Start+Stop

Single beep on 'start', double beep on 'stop'.

The double beep is useful to warn you when the video camera stops, while recording in Remote Roll by LTC.

It is also a means to tell your boom to keep the mike in the same position since you are still recording the background noise after the director's 'CUT!'.

## 08 Clip Detect

Beep On Beep Off

## 09 No Ext TC

Beep On Beep Off

Activated if the external clock is missing while in External Clock mode. The beep is automatically disabled while recording 'w' (wild track) takes.

## 10 Beep Route

Phones, Ph+Line-out, Ph+Foldback, Ph+Lo+Fb

## 11 Beep Level

0dB to -60dB

## 12 Meter Speed

1 Fast 2 3 Med 4 5 Slow

Select '5 Slow' in low temperature conditions.

## 13 Peak Hold (peak hold duration)

0.5 sec to 5 sec

## 14 Bat L Alert 15 Bat R Alert

10.8 Volt to 14.0 Volt

Each battery can be set to its own alert level. Automatic switch-over occurs 300mV below the battery alert level. Once one or both batteries' voltage drops below the alert level, a two beep alarm is sent to the headphones.

NiMH battery alert should be set to **10.8V** (10.5V switch-over), and Li-Ion alert to **12.7V** (12.4V switch-over).

## 16 HDD Pwr Dwn

Afr 1min to Afr 255min

In STOP, the HDD eats half of Cantar's power, it is wise to put it to sleep. While in sleep, the 'three-platter' icon blinks. Go to TEST to wake-up the HDD; it will be up to

speed within 3 to 10 seconds, the pre-record buffer hides this speed ramp-up. Cantar's cold start from a totally un-powered machine to recording is a blazing 2 to 3 seconds.

**note:** during IdleCopy the HDD doesn't go to sleep.

## 17 Serial Com

Factory Bluetooth

'Factory' for maintenance techs, 'Bluetooth' for PDAs.

**note:** on Cantar-X2, the Ethernet interface is permanently active.

## 18 FactoryReset

No Yes

All menu parameters are reset to their factory default.

## 19 MaxFileSize

260MB 690MB 2GB 4GB

The current file is closed and the next one opened when the set limit is reached, without losing a single sample. Four lengths are available: 260MB (1 track for 30 min @ 24-bit/48kHz), 690MB (for 700MB CD-Rs), 2GB (FAT32 basic limit), 4GB (Indaw max file size). You also have the choice of triggering the jump yourself by swiftly changing from REC to PPR and back to REC.

## 20 Show Temp

Temperature is displayed on this screen until you exit this item.

### • Lcd+02

The heater option displays the circular LCD's temperature that the heaters control. It takes about fifteen minutes to reach the +2°C to +4°C equilibrium in a -15°C environment. To save power, Cantar should be in a carrying bag, preferably with insulation. Also, it is recommended that you set TECHSET.12 'Meter Speed' to '5 Slow'.

### • Hdd-12

This is the Cantar internal temperature. Below -5°C, it is recommended to replace the standard Travelstar HDD with a low temp disk such as the 40GB Hitachi Endurastar or a solid state disk (p.41). Below -15°C (or higher than 5,000m altitude, or very bumpy environments), use an SSD (see p.41).



## 21 System Time

00h32m24s

Enter the time from your watch ( $\pm 5$  minutes), especially if you just started working in a new time zone. The system's date (which relies upon hour and minutes around midnight) is used to sort the workdays, it should not be confused with the timecode which is used for syncing picture and audio.

## 22 System Date

2004y04m22d

The system date is used to create the folder name (YYYYMMDD) containing the files for that workday. Note that the workday folder can contain hours past midnight, if the recording session is not interrupted (e.g. turning 'OFF' the Cantar). The workday is also used to fill the default MMDD name of the TapeRef field.

## 23 Hardwr IDs

SN 0520, MoBo CM5 (CM3), Preamp SL1 (SLO),  
Ether ET1 (none), Conv AD5 (AD3)

Cantar's Serial number, Motherboard, Preamps, Ethernet interface, A/D converter versions. Keep these labels in mind when contacting Aaton's technicians.

## 24 License Key

Unlimited 24 Days

Protection against unauthorized use: Cantar goes to 'general freeze' after a given number of calendar days. The key can be activated or deactivated by a CMU software key emailed by Aaton. If 'Unlimited' appears, go no further, your Cantar is set to work forever.

## 25 Softwr Ver.

v2.11 v2.12b (beta)

The current software copy is stored in Cantar's EEPROM, no need to keep it in the HDD. You should not keep more than three versions; erase the old ones. To install a new version, see below.

## 26 Softwr Load (new software installation)

No Yes

As a registered Cantar owner, get the latest version from <http://soft.aaton.com/swcantar/>. Put the file (can-xxx.flb) on your Mac/PC desktop.

### Instructions

*please read completely before proceeding*

**1** Connect a cable to the Cantar Firewire socket while it is *unpowered* (p.5).

**2** To avoid any power interruption during the following operations, **ACTIVATE BOTH ON-BOARD FULLY CHARGED BATTERIES** by simultaneously pressing the [battL] and [battR] buttons for 3 seconds. A loss of power will prevent Bios re-installation; 'ERROR Num 1B XILINX' will be displayed, meaning 'Return Cantar to the factory'.

**3 First** unmount the HDD in TECHSET.01 'Disk (un)mount' *then* connect the Firewire cable to the computer. The Cantar HDD icon will be displayed on the computer's screen.

**4** Copy the can-xxx.flb file to the root of the Cantar HDD. *NEVER install a version lower than 1.78.*

**5** Dump the Cantar HDD icon out of the computer, then disconnect the Firewire cable (see the warning in TECHSET.01 'Disk (un)mount', p.32).

**6** Set TECHSET.01 to 'Mount' the internal HDD; this is done when the 'three-platter' icon is no longer blinking.

**7** Set TECHSET.26 'Softwr Load' to 'Yes'.

**8** Select the desired version, [ok]. For safety, all controls are disabled during this one minute operation. **Do NOT touch** anything until 'Success Press Shift' is displayed.

**9** Press [shift] to finish the installation and shut down Cantar. Set the [MainSelector] to STOP, and restart.

**10** Cantar is protected from the installation of corrupted software. Go to TECHSET.25 'Softwr Ver.'; if the new version doesn't show up, that's all the message you will get, something went wrong, re-download the software from the Aaton site and re-install.

### Software Installation from an external disk

Connect a go-between disk to your laptop and copy can-xxx.flb to the disk root. Unplug it and hook it up to the Cantar Firewire port. *Activate both on-board fully charged batteries* by simultaneously pressing the [battL] and [battR] buttons, then follow steps **7** through **10** above. This method works because Cantar, while installing software, first looks for .flb files in the root of the external disk.



01 Select Project Name	07 Full Title ...
02 Create New Project	13 Picture Format
03 HDD in Use	14 Column layout
04 Disk Formatting	15 A-Column 02 ...
05 Scan Disk	29 A-Column 16
06 Delete files	

## 01 ProjectName

### AACANTAR EDEN-END

Max. eight characters. A factory preloaded project, 'AACANTAR', is stored on the internal HDD. If the disk has been erased by the rental facility, 'No Project' is displayed. Going directly to REC creates a provisional AACANTAR project folder.

## 02 New Project

### SHADOWS\_

A HDD must be connected. The bottom line of the rectangular screen displays the projects already stored. Press [ok] to create a NEW project (8 alpha/numeric characters), a triangle points at the character to be set. [jog] to select a character then press [>] or [<] to go to the next letter. Name entered, press [ok] and go to REC to immediately validate it by recording a very short file.

## 03 HDD in Use

### Int.HDD Ext.HDD Int+Ext.HDD

Audio files can be recorded on internal or external HDD or both simultaneously. When listening to recorded files, only the internal drive plays. To listen to files on the external drive, switch to 'Ext.HDD' and don't forget to switch back afterward.

If external and internal HDDs are simultaneously recording, the message panel displays the lowest remaining disk space in Mega Bytes.

*Q: I connect an external HDD and wait for its activity LED to turn green. I selected SESSION.03 'Int+Ext.HDD' but the external HDD doesn't mount!*

*A: Wait for the external 'three-platter' icon to stop blinking in the middle circular screen, then go to 'Int+Ext.HDD'. If Cantar still doesn't see the disk, most probably it is not formatted with a FAT32 primary partition. Format it with Cantar (see below).*

## 04 Disk Format

### HDD DVD-RAM

Almost identical operations for HDD and DVD-RAM.

### HDD erasing/formatting (auto-FAT32)

Since Cantar HDDs do not use a proprietary format, they are directly accessible by both Mac and PC. Each disk must be formatted as 'One primary partition' under FAT32.

**Internal HDD:** Open the internal HDD compartment (a ten second operation) and disconnect it. Following the instructions below, re-connect it to Cantar as an external HDD. This is protection from accidental erasure by idle fingers.

**External HDDs:** Firewire connected, Cantar will format them up to 127GB which is Microsoft's marketing limit for FAT32. To format a larger disk, see 'tutorial: disks' (p.41).

### Instructions:

**please read completely before proceeding**

**1** With no external HDD plugged-in, go to SESSION.04 'Disk Format', [ok], 'Shift+Red' is displayed.

**2** Press and hold the [shift] [red] buttons while connecting the external HDD to Cantar, and continue to press until 'Formatting' is displayed on the rectangular screen, then release both.

*To avoid connection mishaps, plug the Firewire cable into the Firewire socket and hold it with the retaining screw while Cantar is not powered (p.5), then, at the last minute, carefully plug the other end of the cable into the HDD.*

**3** 'Done' is displayed when finished. A 'three-platter' icon is displayed on the middle circular screen. Go to STOP.

**note:** HDDs are now low cost consumer products and their life span ranges from one to three years. Formatting a disk doesn't protect you from dead clusters. Regularly **scan** your disk(s), see SESSION.05 'Scan HDD below; even if it only detects **one** defective cluster, immediately discard the drive.





## DVD-RAM formatting (auto-UDF 1.5)

Cantar can record onto FAT32 DVD-RAMs but for Mac/PC interchangeability, it only offers to format them under UDF 1.5.

### Instructions:

please read completely before proceeding

**1** With Cantar powered, go to SESSION.04 'Disk Format', press [ok], 'Shift+Red' is displayed.

**2** Insert a DVD-RAM in either the external or internal burner. Before the 'one-platter' icon is displayed, press [shift] [red] together. Keep them pressed until the 'Formatting' message is displayed on the rectangular screen.

**3** 'Done' will be displayed when the format has finished. The 'one-platter' icon appears on the right circular screen to indicate the DVD-RAM is ready for use. Go to STOP.

**note:** To work with a DVD-RAM on a Mac, see p.41. To play it on a DV40/824, contact Aaton.

## 05 Scan HDD

Int.HDD Ext.HDD

Scanning an 80GB HDD may require two hours to complete. At the end of the scan, the message should be 'No error'. If 'One error' appears, immediately copy all of your files and discard the disk. Remember that a hard jolt can force the disk heads to crash and scratch the surface resulting in one or more dead clusters.

If for some reason you must perform an urgent REC while scanning the internal disk, abort the scan by pressing [esc] for a few seconds until 'aborted' is displayed.

## 06 Del. Access

No Yes

This opens access to file deletion. To reduce disk fragmentation, file deletion only works on full workdays. Use a laptop to perform the *not recommended* erasure of individual files...

Select 'Day to Del' The cursor (black triangle) moves to the bottom, [jog] to select the day to be deleted, then [ok]. The bottom line will display 'ScanningDay', then the cursor goes back to 'Day to Del'. [jog] to 'Del Int.HDD' or 'Del Ext.HDD' then [ok]. [jog] to 'Yes nnnMB', then [ok]. Once the files have been deleted, 'No Files Found' is momentarily displayed, then the bottom line changes to 'No 0.0MB'. [ok] returns to 'Day to Del', [esc] goes back to SESSION.01 'ProjectName' where another project can be selected.

## Sound-Report – Headers

Eight header items – FileType, TapeRef, ToneLevel, Sample rate, Bit-depth, FPS, Date and Media – are automatically filled with the recording parameters, while seven others (see 08 to 14 below) carry operator entered data. Multiple changes to each header item are allowed per workday. If one header item changes, a new PDF and ALE page is started with this information.

## 07 (Project)+Full Title

For consistency the 8 character Project name is automatically inserted in the header before of the operator entered Full Title. (max: 39 characters). All of the header entries below are automatically recalled when re-opening the project.

**08 Production** (max: 30 chars.)

**09 Director** (max: 25 chars.)

**10 Sound Mixer** (max: 25 chars.)

**11 Location** (max: 25 chars.)

**12 Day's Topic** (max: 19 chars.)

**13 Pic Format** (PAL, NTSC, HD1, HD2)

**note:** to clear each of these fields individually, press [shift] [esc].

Title: Shadows Prod: AATON Director: Adam Sound Mixer: Josephine				Pic Format: PAL Topic: Jane meets Paul Location: Grenoble				Cantar # 032 TC tpe: 24.00 Digit: 48KHz-24 bits Tone level: -18 dB				SOUND REPORT # 070826AD Media: Snap Report 20070829.AAD Type: Monophonic Tape Ref: 0829			
ID	Filetag	Scene	Take	TC start	Duration	T1	T2	T3	T4	T5	T6	T7	T8	Size	TC state A
1	GB0476	1/1	115	11:26:30	00:01:07	Paul	Jane	Eva	telephone	trage		Mo left	Mo right	8 MB	11:26:32:02
telephone call															
2	GB0477	1/1	116	11:27:48	00:01:43	Paul	Jane	Eva	telephone	trage		Mo left	Mo right	14 MB	11:27:49:03
telephone call															
3	GB0478	1/1	117	11:30:45	00:00:08	Paul	Jane	Eva				Mo left	Mo right	1 MB	11:30:47:07
meeting															
4	GB0479	1/1	118	11:30:58	00:00:58	Paul	Jane	Eva	street	street		Mo left	Mo right	8 MB	11:30:59:12
meeting urban traffic															
5	GB0480	1/1	119	11:37:33	00:00:33	Paul	Jane	Eva	street	street		Mo left	Mo right	4 MB	11:37:39:07
meeting urban traffic															
6	GB0481	1/1	120	11:38:28	00:00:28	Paul	Jane	Eva	street	street		Mo left	Mo right	4 MB	11:38:30:29
meeting urban traffic															
7	GB0482	2/2	121	11:38:54	00:00:08	Paul	Jane	Eva	park	park		Mo left	Mo right	1 MB	11:38:56:02
meeting in the park															
8	GB0483	1/1	122	11:39:03	00:00:25	Paul	Jane	Eva	park	park		Mo left	Mo right	20 MB	11:39:08:08
meeting in the park															
9	GB0485	1/1	124	11:43:13	00:00:41	Paul	Jane	Eva	park	park		Mo left	Mo right	5 MB	11:43:18:25
meeting in the park															
10	GB0486	1/1	125	11:43:56	00:00:44	Paul	Jane	Eva	park	park		Mo left	Mo right	6 MB	11:44:00:24
meeting in the park, children playing															

Generated by Cantar M00032 version 1.87

Page: 1/1



## Sound-Report – Columns

User configurable, they carry take specific data.

### 14 Col Layout

Layout-A      Layout-B      Layout-C

Three operator created custom layouts can be selected; they are stored in Cantar's memory and can be modified by [jog]-ing through the column/field linking positions (see SESSION.15 below). The first letter identifies which layout (A, B or C) the selected column is modifying (e.g., A-Column 12, B-Column 12, C-Column 12).

### 15 A-Column 02 to 29 A-Column 16

[INS field]	[DEL field]	Blank	Filetag
Scene	Take	TC Start	TC End
Duration	TC SlateA	TC SlateB	TC SlateC
Trackrank	Tracks used	FileSize	User-bits

The column '01' field carries the file recording order used to sort the events, it is not modifiable,

To assign a different field to columns 02 to 16, press [ok] and use the [>] or [<] to select one of the fields above.

[DEL field] eliminates the field assigned to the selected column and shuffles the fields on the rightside to the left; 'none' is displayed on the last column. If you want to activate a 'none' column press [ok] to change it to 'blank' then select any field for it.

[INS field] inserts an empty placeholder ('blank') that can be filled with a specified field; other fields are pushed to the right... provided there is at least one 'none' column on the far right.

Trackrank represents Track 1 through Track 8.

## Sound-Report – Delivery

### Name composition

In order for the latest entries of the day to be taken into account, the most recent report overwrites the former one. Two independent PDFs are created: 'All' contains all of the take-types (t, p, w, a, n), 'Wild' contains the 'w' takes only. The name (max: 8 char.) of the report indicates the treatment applied to the files.

For example, 071224AR is made of:

- 071224, the YYMMDD of the calendar day.
- A = all takes, W = wild takes only.
- D = Direct multi-mono, N = Native poly,
- R = Rotated poly, X = miXer poly.

*Actual generation (see BACKUP chapter)*

#### • Any time

Go to BACKUP.11, contrary to 'Idle Report', 'Snap Report' lets you select Dir, Nat, Rot, or miX of your choice. Press [ok] to immediately build a Sound-Report and send it to the YYYYMMDD.AA§ folder (§ = D, N, R, or X) on the drive(s) in use as selected in SESSION.03.

#### • After 'IdleCopy' is finished

Before [eject]-ing the DVD-RAM or removing the external HDD, set BACKUP.12 'Idle Report' to 'Yes'. The Sound-Report automatically carries the same 'Dir' 'Nat' 'Rot' 'miX' status as the files recorded on the backup disk. It is sent to the YYYYMMDD.AA§ folder, (§ = D, N, R, or X).

#### • During 'Backup@Call'

Set BACKUP.13 'Run Backup' to 'Yes'. The Sound-Report automatically carries the same 'Dir' 'Nat' 'Rot' 'miX' status as the files recorded on the backup disk. It is sent to the YYYYMMDD.AA§ folder, (§ = D, N, R, or X).

## Sound-Report – Notes

1 Stored in the iXML chunk of each BWF file, the operator's comments (max: 200 char.) are used as separators in the PDF print-out.

2 Not yet able to read the iXML chunk, the Avid MCs only have access to the first 40 characters of the comments stored as 'aNote' in the BWF descriptor line.

3 It takes a little more than one minute to build a twelve page PDF report. A CSV tab-delimited text report for spreadsheet applications is generated, as well as an ALE list for editing machines; one ALE per matching header.

4 The paper size is unified to 21x27.2 cm, this fits both 'A4' and 'Letter' formats.

5 **Warning** On Mac computers, open the PDFs with 'Preview' (Aperçu), they can't be printed by Adobe Reader nor Acrobat.



- |                         |                      |
|-------------------------|----------------------|
| 01 Save mode            | 08 Files to copy     |
| 02 Day to copy          | 09 File name         |
| 03 Track selection      | 10 Media label       |
| 04 T1-TX treatment      | 11 Snap Sound-Report |
| 05 T7 T8 treatment      | 12 Idle Sound-Report |
| 06 Media type selection | 13 Clean Polys       |
| 07 Burn and Check       | 14 Run Backup        |

## 01 Save Mode

IdleCopy Backup@Call PolyStore

### • IdleCopy

can be activated any time, the earlier in the day, the better. Parameters excluded by a preceding choice are flagged as 'N.A.' (not applicable). When the internal HDD is not occupied by any other task, i.e. in TEST or STOP, Cantar incrementally copies the files of the day onto a DVD-RAM (external or internal) or an external HDD. By the end of the day most audio files are copied. This is an alternative to the simultaneous recording on both the internal HDD and external HDD. IdleCopy automatically updates archived files; if you modify the metadata of an internal HDD file, its copy is erased and re-saved.

To interrupt the process, go to PPR or press [esc] until 'IdleOp Stop' is displayed in the rectangular screen; the unfinished file copy is deleted. The operation will resume as soon as you go to TEST or STOP. Once IdleCopy has completed, the backup disk goes back to sleep.

**DO NOT remove the external HDD or DVD-RAM until the IdleCopy job is completed, see 'Pazienza!' (p. 19).**

Toggling between TEST and STOP displays the remaining disk space in Gigabytes. If, at the end of your next recording, the file is too large to be idle copied within the available backup disk space, 'IdleCopy Full' is displayed on the rectangular screen. After you [eject] the DVD-RAM, insert an empty one; the backup automatically continues from where it previously stopped.

### • Backup@Call

Opens access to the parameters requested for BACKUP.14 'Run Backup'. note: only trigger 'Run Backup' *at the end of the day* to copy the files onto the external HDD. If you modify a file's metadata after you have saved the file with Run Backup, it will not automatically resave your updated file(s) during the next Run Backup of the day. It is preferable to use IdleCopy which resaves files that have been updated.

### • PolyStore

To speed-up the end of day 'Run Backup', PolyStore copies on the internal HDD the provisional 'Poly files' resulting from the treatments done during idle periods and during backup@call on DVDs. From time to time, it is good to clean these poly files from the HDD (see BACKUP.13 'Clean Polys').

## 02 Day to Copy

2007-02-18

The current day is selected by default. Previous days can be selected too. To simplify archive creation and retrieval, Cantar only copies one day per CD/DVD. Several days can be copied on an external HDD, each day in turn.

## 03 TrackSelect

BACKUP 03  
TrackSelect  
T1-T8 (7&8)

T1-T8 \*T1-T8 (7&8) T1-T6  
\*T1-T6 (7&8) \*T7 T8  
\*Of interest if the T7 T8 pair is a  
mixdown. (v2.1x)

## 04 T1-Tx Trtmt

mono-Direct poly-Native poly-Rotate

For T7 T8 alone see BACKUP 05 below.

BACKUP 04  
T1-T8 Trtmt  
poly-Native

• **mono-Direct** leaves the iso tracks in their original form (AB1234\_1, AB1234\_2), and puts them in an .AAD folder identical to the

Cantar HDD one.

• **poly-Native** makes long poly files AB1234.PN by interleaving the native iso monofiles while keeping their rank, then stores them in an .AAN folder.

• **poly-Rotate** is available only for T1-T8 (7&8); it moves the T7 & T8 iso tracks to the T1 & T2 positions while pushing T1-T6 to T3-T8, and makes a poly file AB1234.PR stored in an .AAR folder.

BACKUP 04  
T1-T8 Trtmt  
poly-Rotate

The poly-Rotate treatment solves the Avid composer inability to put tracks where the editor wants them: for example on a composer the mixdown pair goes to positions 1 & 2 of the audio timeline, unfortunately the composer automatically puts the T1 and T2 iso tracks of a multitrack recording there too!



Consequently if during the course of his work the editor decides to import the T1 to T6 original tracks, the composer will kill the mixdown tracks he has been using from day one! Thanks to 'poly-Rotate', the original mixdown iso tracks T7 & T8 (moved to T1 & T2) will replace the 16-bit poly mixdown with the 24-bit originals, while the original iso tracks T1–T6 (pushed to T3–T8) will gracefully fall into place while not destroying anything.

## 05 T7T8 Trtmt *mixdown treatment*

**Mono Native Poly Native Poly16Trunc Poly16Dith**  
Only applicable if T7 T8 appears in BACKUP.03 'TrackSelect'. This treatment can perform the reduction from 24-bit to 16-bit, and the conversion of the T7 T8 monofiles into a polyphonic file.

- **Mono Native** (16&24) - changes nothing relative to the original 16-bit or 24-bit files.
- **Poly Native** (16&24) - interleaves T7 T8 at native bit-depth.
- **Poly16Trunc** - interleaves T7 T8, truncates 24-bit to 16-bit.
- **Poly16Dith** - interleaves T7 T8, and dithers 24-bit to 16-bit.

**BACKUP 05**  
**T7T8 Trtmt**  
**Poly16 Dith**

**Note1:** dithering offers a slightly better quality than plain truncation but the process requires twice as much time.

**Note2:** treatments automatically convert 96kHz to 48kHz.

**Note3:** treatments (04 and 05) associated with a (03) track selection are retained from one recording session to the next; they are lost as soon as the (03) menu bottom row is opened.

## 06 Media Type

**CD±R 700MB Ext.HDD DVD-RAM**  
**DVD±R 4.7GB DVD+R 8.5GB**

It can take more than twenty seconds for a DVD or DVD-RAM media to be checked before its 'one-platter' icon appears in the right circular screen, be patient.  
Files can be copied on both FAT32 and UDF1.5 formatted DVD-RAM; For MAC/PC compatibility, see SESSION.04 'Disk Format' (p.35), and 'Tutorial: disks' (p.41).

## 07 Burn Mode

**Burn Only Burn+Check (Check Only)**

Checking a DVD takes just as much time as burning it.

## 08 FilesToCopy

**Unarchived All**

The default is 'All'. Select 'Unarchived' before starting a CD/DVD mid-day copy, this causes the software to look at

the 'Archived' flag on the files. Previously copied/archived files flagged as such will not be copied again. 'All' is used to make a second batch of DVDs carrying all files, previously saved or not.

## 09 File Name

**FiletagOnly With Sc/Tk**

FileTag only: **BA1234\_1.wav.**

With Sc/Tk: **BA1234==123A 12R w14==\_1.wav,**  
this brings the scene and take to the editor's desktop.

- Backuping on CD/DVD, select 'With Sc/Tk' since long filenames are supported by ISO and UDF1.5 formats.
- Backuping on an external HDD, the filenames are forced to 'FiletagOnly' since long filenames are not supported by the basic FAT32 disk format.

Majax (Win-XP or Mac OS-X) extracts the Sc/Tk from the metadata contained in the iXML and can add them to the files en route to the post-chain on FAT32 formatted HDDs.

## 10 Media Label

**CD 1 of 2**

The number of disks needed for the backup is displayed. Press [ok], select the one to burn. [shift] [eye] displays the Media Label created for the disk. CD\_MXD\_2/5 means: CD-R – Mixdown (Xa · Xb) – Disk #2 in a 5 disk group. The remaining data volume to be burned is displayed.

### *The large file case*

The length of a take can make it impossible to copy it entirely onto one CD. For instance if a 200MB long file comes in with its five brothers (a six track take), a 1.2GB CD is required. In this case, Cantar separates the take into its individual tracks while minimizing the number of CDs (or DVDs). The label becomes CD\_2\_D072, where [CD] is the media; [\_2] the track #; and [D072] the last four characters of the filename.

### *Example of a CD/DVD label*

An ISO volume label is limited to 31 characters

Cantar#	Project	Date	Archiv	Tag type	1 or 2
099	AAAAAAA	YYYYMMDD	*	CD_T1-6_001	

The archive flag (\*) is either a (sp) space or a (#) to show if only not yet archived files have been burned; a way to know why some files, probably burned on another media,



are missing.

**Tag type1:** CD\_T1-6\_001 general mode for DVD burning. T1-6: six mono tracks from AAD folder, T1-8: eight mono tracks from AAD folder. MXDN: monophonic stereo mixdown from AAD folder. MXBN: poly stereo mixdown from AAX folder. MXBC: poly stereo mixdown with 24-bit to 16-bit reduc. 001 to 999 (media rank).

**Tag type2:** CD\_TK-1\_001 used if the files must be separated because their group is too large to be burned on a single 690MB CD. TK-1 is the track number and 001 the media name rank.

## 11 Snap Report

None Direct Native Rotate miXdown

Snap immediately stores the day's Sound-Report into a YYYYMMDD.AA§ folder (§= 'Dir', 'Nat', 'Rot' or 'miX') on the drive(s) in use. (see 'Sound-Report - Delivery', p.37).

## 12 Idle Report

No Yes

**Before [eject]-ing** the DVD-RAM or **removing** the external HDD, select 'Yes' and [ok]. This copies the Sound-Report to a YYYYMMDD.AA§ folder (§= 'Dir', 'Nat', 'Rot' or 'miX') which carries the same status as the files recorded on the backup disk (see 'Sound-Report - Delivery', p.37).

## 13 Clean Polys

No Yes

This operation deletes all of the previous day's Poly files resulting from intermediary treatments stored in the internal HDD. Obviously if you later have to deliver another backup copy containing Poly files, the Backup@Call will take longer since it will have to recreate the deleted files. As a precaution, only the Poly files of preceding workdays can be deleted.

## 14 Run Backup

No, nnnnMB Yes, nnnnMB

BACKUP	14
Run Backup	
Yes 360MB	<

The default is 'No' with the size of the files to be saved. This allows you to quickly visit and immediately leave using the

same [ok] button.

RunBackup automatically inserts a Sound-Report carrying the same 'Dir' 'Nat' 'Rot' 'miX' status as the files recorded on the backup disk.

The Sound-Report builder adds about one minute to the backup process; three files are produced: a ready to print PDF, a tab delimited CSV for spreadsheet applications, an ALE list for editing machines.

### Example of a standard backup

Select 'T1-T8 (7/8)' in .03, 'mono-Direct' in .04, 'Poly16Trunc' in .05, 'Ext.HDD' or 'DVD-RAM' in .06; you get a Poly16-bit mixdown plus all the native 24-bit monophonic tracks on an external HDD or DVD-RAM.

### The several disk case

Go to BACKUP.10 'Media Label', select the disk you wish to burn, [ok], BACKUP.14 'Run Backup', [ok], 'Yes', [ok]. Go back to 'Media Label', choose the next one and so on. You can interrupt the process between two disks and return to it later. Don't forget to write Cantar ID, Project name, Date, and Media label onto the CD/DVD as it comes out, so as not to waste time looking for the ones you haven't done yet! Upon completion of writing, the disk will need to be manually ejected. When the green indicator starts blinking, press the burner's [eject] button.

### Direct backup from a Mac or PC

Once TECHSET.01 has 'Unmount'-ed, the internal HDD is no longer under the Cantar CPU's control but is still powered; a Firewire connected MAC or PC sees the Cantar HDD as any other HDD, and can copy the files, perform selective erasure, and edit the metadata with Majax.

**Warning:** To prevent destruction of the Firewire input (max: 16.6 V) by the Mac GX (33 V), open the disk compartment, disconnect the HDD and connect it to the GX; its Firewire input handles up to 40 V. (Mac/PC laptops supply a safe 12 V).

### Corrupted File Retrieval

Cantar saves the disc's FAT every ten seconds but in case of power interruption, the last file is left open and unplayable. Also, if by accident you erase important file(s), do NOT continue to use the HDD. IMMEDIATELY remove it and send it to Aaton. Do not use any standard recovery programs, this is guaranteed to DESTROY any audio that could have been otherwise saved.



# Tutorial 1, "Disks"

p.41

## HDD (hard disk drive)

The Cantar HDD is a PATA/IDE 2.5", 80GB disk running at a low 5400rpm for minimum power consumption and heat generation. If you replace it with a larger one, be sure it doesn't get too hot, and verify that the static electricity grounding path between the disk housing and the Cantar chassis is still within factory specs (120k ohm,  $\pm 20k$  ohm). The current trend is to choose 160GB/250GB disks. FAT32 can handle up to 2TB, but Microsoft lets it be 'universal' below 127GB only; Cantar formatting is thus limited to this value. If you nevertheless want Cantar to exploit their full capacity, format them as FAT32 with *Partition-Magic* <http://www.symantec.com/norton/products/overview.jsp?pcid=sp&pvid=pm80> installed in a Windows-XP PC, and make **one primary** partition, not logical partitions.

**note:** hot HDDs can become temperamental and trigger 'Bus Hangs'; preferably use a 'cool' Firewire enclosure, such as the GDrive <http://www.gtechnology.com/Products/G-DRIVE-mini.cfm>. If you suffer from connection problems with LaCie Drives, download the latest firmware from <http://www.lacie.com/us/support/drivers/driver.htm?id=10053>

## SSD (solid state drive)

Less than half the power consumption of rotating HDDs, SSDs are a must below -15°C, higher than 5,000m altitude and very bumpy environments. The currently available *Samsung* 32GB PATA MCAQE32G5APP-OXA and *Stec* ZEUS PATA 64GB 2.5" are compatible with Cantar's Firewire-to-PATA/IDE bridge, see pic.above. Because they feature a built-in 'wear leveling' function which spreads the workload to all memory cells (insuring the front cells are not always under fire), SSDs are much more reliable than CF cards which can't survive the many read/write cycles that audio recording requires.

## CF (compact flash card)

Abandoned by digital cameras in favor of the less fragile SD cards, CFs are on their way out. If you must use them, connect a Sandisk SDDR4-CF-901 to the Cantar FW socket. Format them as FAT32 using Windows XP or Vista.

## CD/DVD Burners

CD/DVD burners such as LiteOn tray SW431/ SW852S, Pioneer tray DVRK14, NEC tray ND6500A (good burner, but only accepts hard to find 8x DVDs) should be replaced with the Panasonic-Matshita slot UJ-85J or UJ875 which



burn DVD-RAM and accept the latest 16x DVD±R.

**Internal** To install or replace an internal CD/DVD burner, see p.5. When Cantar abruptly goes to REC, the DVD-RAM burner closes its unfinished idle-copy task and generates magnetic interference for a few seconds. That is why it must carry an Aaton mu-metal shield plate (p.51).

**note:** Setting TECHSET.01 to 'Unmount' opens access to the Cantar DVD-RAM burner through the Firewire socket; this is quite useful to edit metadata with a Mac.

**External** Cantar determines whether an external burner is Firewire connected, if it contains a blank disk and if the internal burner is empty, it will choose the external burner to run the backup.

**CD/DVD Disks** *never use supermarket branded media*

**CD-R** Made by Taiyo Yuden, Maxell 'Pros' are the best.

**DVD±R** Ask the Post Production supervisor what is his preferred flavor (+ or -). Taiyo Yuden 8x are the best but difficult to find; to print labels, use their "Watershield" disks, they are more water resistant than normal white printables. Cantar burns all DVDs at 4x to improve their lifespan.

**DVD-RAM** Panasonic 3x LM-AF-120LE.

## CD/DVD Disk Handling

98% of all media failures are caused by poor handling. A dirty DVD can still be played, but if it has nothing more than fingerprints, it is unuseable for recording. Open your thumb and index-finger in a U-shape and hold the blank disk by its opposite edges. Do NOT clean an optical disk with a cloth in a rotary motion (best way to destroy a complete track) but by successive radial strokes.

**DVD-RAM & the MAC** *(see Majax Q/A p.50)*

DVD-RAM disks are read-only on Macs, this prevents modification of the file's metadata. To compensate for this infirmity, install 'WriteUDF' <http://www.softarch.com> and replace the Mac 'super-drive' by a Matshita UJ-8xx, or buy a Panasonic standalone burner. Or use the Cantar DVD-RAM burner in its TECHSET.01 'Unmount'-ed state.

**note:** SATA-IDE HDDs & SSDs will be available by Sept. 2008 with the Aaton made Firewire-to-SATA bridge.

### Surround 5.1

When using SoundField or Schoeps mics, there is no need for a special decoder; Cantar has it all, built-in!

#### Double M/S\*

**Microphone wiring:** with the Schoeps double M/S (L-C-R-SL-SR) head made of two cardioid and one figure-of-eight microphones, a decoding accessory is not needed. Schoeps delivers an XLR7 extension cable to which a home-made XLR7 to XLR5/XLR3 Y cable should be connected.

- **XLR7(F)** 1 = gnd 2 = +Mfront 3 = -Mfront  
4 = +Sfront 5 = -Sfront 6 = +Mrear 7 = -Mrear
- **XLR5(M)** 1 = gnd 2 = +Mfront 3 = -Mfront  
4 = +Sfront 5 = -Sfront (yellow, red labels)
- **XLR3(M)** 1 = gnd 2 = +Mrear 3 = -Mrear (grey)

**Track routing:** the **XLR5** goes to Mic3/4 inputs routed to Track3 and Track4 which should be M/S declared; the output is automatically left/right decoded for monitoring. The Track3 and Track4 mixer faders being at 100%, the front stereo is heard.

The **XLR3** goes to the Mic5 input routed to T5; the pan-pot for this track should be put in central position (mono listening). The T3 mixer fader being at 0% and the T5 mixer fader at 100%, the monitor output becomes the sum of the S figure-of-eight mic on Track4 (a+ a-) and the M rear mic on Track5, the rear stereo is heard. It is thus easy to alternately listen to the front or rear M/S; or both with 5.1 double capsule headphones.

**Mixing stage:** launch Pyramix and make two M/S strips, one for the front, one for the rear: lay down the three track media on the M/S Tracks (the Pyramix CW center width), copy Track2 «S front» onto Track4, which becomes «S rear». Reinject the M front onto the surround of the M/S front. You can also make an extraction for the 'sub': here is your 5.1 sound!

*\*A proposition of Francois Musy and Gabriel Hafner, NSM Switzerland.*

### Soundfield B-Format

Cantar is the only on-location digital recorder allowing the STEREO monitoring of the 'complete' **Soundfield B-Format** (which includes 5.1) with no extra accessories. Thanks to its on-board mixer sliders, it is easy to monitor in STEREO while dynamically adjusting the 'space' parameters: pattern, width, rotation. Since the gain of the preamplifiers (Mic or Line level) can be ganged to one master fader only and monitored to the half dB, Cantar insures total control over the B-format later treatments.



### Documentary situations

#### Over the shoulder M/S

The boom on Mic5 routed to Track1 (the Mic5 fader is the one which naturally falls under the right hand), the 'calm' RF mic on Line-in 1 routed to Track2: you get the boom and the calm RF mic on the left circular screen. The 'active' RF mics on Mic1 and Mic2 are under the control of the two front faders; routed to T3 T4 they are together displayed on the middle circular screen. The stereo pair connected to the coupled Mic3 Mic4 inputs (only one XLR5 to XLR5 cable) are routed to T5 T6 and displayed on the right circular screen; they momentarily let you replace them ([eye] button) with the T7 T8 tracks which carry the mixdown.

Boom	> Mic5	> T1
RF mic, calm	> Lin 1	> T2
RF1 active	> Mic1	> T3
RF2 active	> Mic2	> T4
Stereo-L or M	> Mic3	> T5
Stéreo-R or S	> Mic4	> T6

#### Mixdown with decoded M/S (or not)

The mixer faders and pan-pots feed the mixdown (Xa Xb) tracks. The inputs are routed to the six tracks; an M/S couple is connected to Mic3 & Mic4, routed to Track5 and Track6, M/S declared. The M and S signals are recorded as metered on the T5 T6 modulometers and stereo decoded into the mixdown output. If the editor prefers not to get stereo signals in his reference sound, pan the MTrack to one side or the other: the STrack will disappear from the mix.

#### The boom and RF mics:

The boom, connected to Mic5, is directly routed to Track7 (T7 T8 IN-GRIDS, p.27). The RF mics, routed to Tracks T1, T2, T3, T4, T5 and T6, all pan-potted to the right, go to Xb (Track8).

### Cantar & video cameras

#### Practice 1: Real-time Audio-TC in both machines.

The best method to sync Cantar to any video camera is to install a small LTC generator, such as an Aaton GMT, on the camera. A less desirable alternative is to use an RF link to send LTC from the camera to Cantar, which is slaved in External Clock mode.

The GMT timecode is recorded on one of the camera's audio tracks; don't forget to turn 'OFF' the automatic-gain and any other audio processing. This LTC is later extracted by an Avid composer (e.g. XpressPro v5.8+) or FCP (with AUX-TC-FCP <http://www.videotoolshed.com>) which correlate the continuous record-run Video-TC of the camera with the discontinuous free-run Audio-TC of the GMT (see pic.). Thanks to the common TC between Cantar's audio files and the audio LTC indexed images, Avid or FCP can 'autosync' the two media. This method is in use for years to sync telecine transferred AatonCode films. Please read the Avid 'autosync' instructions about the track VA1A2 rules in 'The PostChain' document (see p.50).

Compared to the radio transmission of record-run TC plus TC break detection by Cantar, **real-time syncing** has two advantages: it works in multicamera shooting, and it is low power and fail safe. Compared to the '*free-run discontinuous Audio-TC as Video-LTC reference*', it has the superiority to let each video camera use its own record-run continuous Video-TC, something much appreciated by video-post facilities.

#### Practice 2: Video-TC in both machines, DayStamp used as TapeRef (Reel ID)

How to conform the Cantar audio files if the Avid editor only works from the videotapes carrying the mixdown sent to the video camera? There is neither a filetag to ensure a link between the original tracks and the EDL reference nor a usable date in the user-bits; every day the same indistinguishable Video-TC appears in the audio files.

The way to conform the original files to the EDL is to either insert the VideoTapeID in the audio files (the old obsolete method, see '*A demand to be resisted*'), or to use the **day** (like on AatonCoded shots) by another means than the user-bits: that is the **DayStamp**.

Reading the following lines, give special attention to the difference between the 'AudioTapeRef' which stores the DayStamp into each and every audio file, and the 'VideoTapeID' label which is not recorded on the video



media but entered by the assistant-editor during the image import. Here is how it works:

- Using the 'workday' rule which organizes the audio folders, Cantar stores the 'Month-Day' DayStamp into the 'AudioTapeRef' iXML metadata. Alternately you can overwrite the Cantar 'Month-Day' with the 'Day Rank', e.g. day one D001, day sixty two D062 (see PPR).

- The video camera operator writes the "Month-Day + Camera ID + Cassette number" on the videotape box for the digitizing assistant-editor to later key-in the six character 'TapeID' column of the Avid NLE.

April 18, camera-A, cassette 9 = 0418A9

April 18, camera-B, cassette 2 = 0418B2.

The (1 to 9 then A to Z) last character can identify 35 cassettes per day per camera... a very long workday!!

- To perform the auto-conforming of the original Cantar files, Titan-3 first sorts them by comparing the leading four characters (0418 or D062) of the Avid EDL 'VideoTapeID' column with the 'AudioTapeRef' found in the audio file iXML metadata, then it uses the timecode in- and out-points to finish the job.

The TC can be free-run or record-run, provided Cantar and cameras share the same TC.

#### A demand to be resisted

The confusion between 'AudioTapeRef' and 'VideoTapeID' induces editors to ask sound recordists to enter the camera/cassette IDs in the 'AudioTapeRef' field; this is not good: 1- quite often the sound recordist is warned too late of the camera cassette change-over, 2- in a multi camera shoot, there is no provision to enter double or triple camera cassette IDs into the metadata, 3- how on a film stage could you enter the video cassette ID of a transfer to be performed the day after?

Nevertheless, if you have to replace the default MMDD DayStamp with a TapeRef, do it either in Cantar (this is the field following 'comments') or with Majax by highlighting the concerned files and batch modifying the 'AudioTapeRef' field. This insures that whatever happens to your files, e.g. mono to poly conversion, mixdown, gathering in a different folder, copy to DVD, flying through the internet..., they will forever carry your given reference.



Cantar plays up to eight tracks from the internal or external drive while recording a selection of these tracks (internally sent to the eight Digi-inputs) along with the 'live' audio coming from the nine analog inputs. To activate the Rec&Play BLUE-FUNCTIONS, press the blue [shift] button while transitioning to a new MainSelector position, and hold it for one second after the position has been reached. Two different modes are available.

**'Live' mode**, two examples: **Classic playback**, telephone calls, background music and wild sounds are played and recorded during a live recording. **ADR type1**, the actor records his replacement dialog *right after* listening to the playback opened then closed by preset cue-points.

The timecode, scene, take, comments and track-names are those of the 'live' take. At each call of a **play-card** (an operator preset playback file segment), a **Linking-Trio** (note1) is created, it links the filetag and TC of the playback file to the new take's TC.

Thanks to the zero delay between the play command and the audio output, plus the sub-frame postsyncing precision brought by its Linking-Trios, Cantar makes external players and 'Music-Slates' obsolete accessories.

**'Clone' mode** Three examples: **Remix**, get a copy of the original iso tracks and a new mixdown performed under the control of the on-board mixer or CantaRem. This mode lets you insert a simultaneous translation of a foreign language dialog. **ADR type2**, while listening to the guide track the performers re-record their dialog on a new set of tracks. The TC of the master can be used to sync a chasing VTR. **Re-recording**, with its ultra-short 0.4msec 'Mic to Phones' delay Cantar is a blessing for incremental recording. It produces 'packs' of eight tracks, easy to stack by the tens because of their identical TC.

Each time a 'clone' file is recorded, it carries the same TC, Scene, Take and Comments as its master file *but with a new filetag*; you will never run the risk of erasing a master.

## Play-file indexing

CantarX1 & X2

First select the audio files you need to playback and put them under indexes **A** to **L**, performed in BLUE-BRWS.01/20 (p.24) they become 'rec&play ready' **play-files**.

**AB** are reserved for the *current day* of the *current project*  
**CDEF** are reserved for *any day* of the *current project*  
**GHIJKL** are reserved for *archives*, e.g. wild tracks, music, etc., stored on external or internal HDDs.

The **archive** files must be grouped on the same drive, same project, same day, and their metadata stored in an iXML v1.50a chunk in compliance with Cantar software v2.11 or later. To **update** old style files, see p.24.

```
BLUE-BRWS 08
Index D <
SE1104 hide
```

To ease navigation during Rec&Play, it is wise to toggle from **view** to **hide** the play-files not needed immediately; to do so, use [esc] instead of [ok] to exit from the file selection row.

```
BLUE-BRWS 21
TC mode <
Clone (x)
```

In BLUE-BRWS.21 'TC mode', '**Live (all)**' gives access to *all visible play-files*.

The recording session will work under the current date, time and metadata of the live recording; '**Clone (x)**' gives access to *play-file x* only and forces it into '**view**'. The recording session will use the date, time and metadata of this play-file.

## Play-card filling

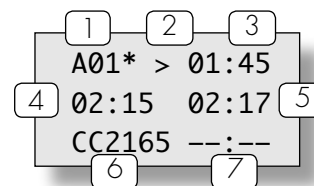
CantarX1 & X2

**1-** In BLUE-PLAY, with [shift] [>], choose a play-file among indexes **A** to **L**, index displayed in (1).

**2-** With [>] or [<], select a card, e.g. **A01... A51**, among the available fifty-one empty cards per file.

*The factory A00 card contains the entire play-file, it does not store a cue-in, and the non modifiable cue-out (7) is the take end, i.e. its duration.*

**3-** To fill an empty card, scrub the audio with the [jog] (4), press the [black] button to set a cue-in (3), scrub further and



press the [red] button to set a cue-out (7); a half second silence is inserted at the cue-out to let you detect and fine tune its position. The last entered cue

points replace the former ones. Once a cue-in is entered (a cue-out is not necessary), an empty card becomes a **play-card**. The cue points are stored in the iXML of the file and will only be removed by erasing the play-card; to do so, [jog] to 00:00 and press [red]. To **hide** a play-card without erasing its cues, press [shift] [red]. Tagged with a '\*' character the card is no longer visible in the BLUE-TEST/BLUE-REC play list, shortening it.

**4-** With [>] select a play-card and press [ok] to play it from its cue-in. If there is no cue-out or if you want to stop the playback before reaching it, press [ok]. Press [ok] again to restart from cue-in. Press [esc] to pause, press [esc] to resume play.



Play-file 'E' from the archives, six play-cards (E34 hidden). Note their free and overlapping placement, suitable for 'classic playback'

**note:** when going to BLUE-PLAY, take your time while passing over STOP! if the message 'you were too fast' appears, go back to STOP for one second.

### Rehearsal

*CantarX1 & X2*

As soon as BLUE-TEST is activated, the playback tracks Tp1 to Tp6 are internally sent to the Digi1 to Digi6 inputs; from there they are routed (or not) the standard way (see 'Suggested in-grids' p.17).

Adjust the relative levels between digi inputs (playback tracks) and analog inputs, then rehearse your intended BLUE-REC navigation; the last BLUE-TEST selected play-card will be the first to be played.

In BLUE-TEST you can swiftly go from one play-card to the next, a very useful tip to let the film-director verify your 'hilited' parts of a take without scrubbing through the entire file.

**note:** Rec&Play works at 48kHz ( $\pm 0.1\%$ ). The play-files are played at the 'Live' recording sample rate, this can be quite useful on filmed music shows transferred to NTSC (see BLUE-REC p.22).

### Live recording

*CantarX2 only*

select 'Live all' in BLUE-BRVS.21

**Playback** In BLUE-REC, the analog inputs are recorded in the standard way. To play the first selected play-card, press [ok] (or [space] if you are using a keyboard). To stop before reaching the card's cue-out, press [ok]. To replay from the cue-in, press [ok]. To pause, press [esc], to resume, press [esc]. To reach the next card, two methods are available, • the bare bone: browse the 'view' tagged play-files with [shift] [>], then select the desired '\*' tagged play-card with [>], • the easiest: connect a PS2 keyboard and type the successive card IDs (B12, F45, A08), then [enter]. Tarkan (p.46) can help you open the play-list in the right order.

**ADR type1** The actor records his dialog right after listening to a play-card from its cue-in to its cue-out (each play-card can be played again and again to satisfaction). The bare-bone browsing (using [>]) is the one to be used.



### Clone recording

*CantarX2 only*

'CloneX' selected in BLUE-BRVS.21

**Copy, Remix & Translate** To get copies of archive files with an updated iXML chunk, select in-grid **RR9** (p.22). To redo a mixdown under the control of the on-board mixer or CantaRem, select in-grid **RR10** in which the Xa Xb mixdown goes to T7 T8; note that you can add a simultaneous translation of a foreign language dialog by either routing two Digi-ins to the same track and sending the translation mic to the 'freed' track, or selecting **RR7** in which 'Mic5 Xb' records the translator's mic on T7 and the mono mix on T8.

**ADR type2** While listening to the guide track(s), and watching the images of the original shoot (the LTC-out of the master being used to sync a chasing VTR), the performers re-record their dialog on a new set of tracks.

In clone mode, no need to press [ok], the selected play-card plays at BLUE-REC start. Since there can be only one TC stamp per new filetag, if you want to remix/ADR a short portion of the master file, go to BLUE-PLAY, create a short play-card and return to BLUE-REC, opening a new filetag.

To abort the take, go to PPR and delete the file (see *Last take erasure*, p.19) and return to BLUE-REC to redo it. You can continue to record live audio after the end point of the master play-files but this 'tail' generates a longer file than the master at the risk of timecode overlap with the next take.

**Re-Recording** Under in-grid **RR1** (see 'Suggested in-grids', p.17), record your first track in normal REC. Go to BLUE-BRVS.04 and put the filetag of your best 'track1' recording (not always the latest one) under '**Index A**'. Select '**Clone A**' in BLUE-BRVS.21, then under in-grid **RR2** go to BLUE-REC and record 'track2' (as many times as needed); then go to BLUE-BRVS.04, and put the filetag of the best recording under '**Index A**'... and so on, up to **RR8**. You get an eight track incremental recording in your last recorded file.

**note1:** the Linking-Trios carry two TCs and the playback file's filetag. Stored in the iXML of each live file, and in the CSV Sound-Report, they help sync the original playback track(s) to the edited program with sub-frame accuracy. The message 'PB filetags: AB1234, XY9753' written in the comment line makes it easy for the final mixer to find the original files by running a filetag search on his computer.



## The Cantar mirror

Through the *Cantar-X2* Ethernet connection, Tarkan controls Cantar's system configuration, creates on-line and off-line\* user setups, and edits all of the metadata stored in the recorder. It works on 1024x768 or higher resolution screens.

**Installation:** Download the correct version from the Cantar software site (see p.3) to a PC (Win-XP) or Mac (OS-X).

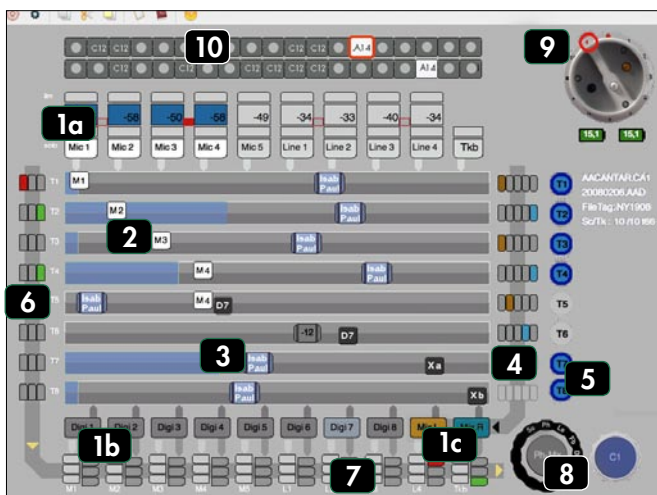
**Cantar Connection** RJ45 socket on the HDD compartment housing, the Ethernet cable can be straight or cross-wired, just make sure it is tightly held by the canyon shaped clamp.

**Laptop Connection** turn off the WiFi to stop any other TCP/IP activity; eliminate the firewall\*. Connect the Cantar Ethernet cable to the RJ45 port. Launch Tarkan and wait (Win-XP: 60 sec, Mac OS-X: 10 sec) before clicking the upper/left 'start' icon which lets the Tarkan server assign an IP address to the connected Cantars (up to ten).

## 1 'Routes'

Tarkan is unique in that the 'Routes' screen displays the audio flow, including the mixer's faders and pan-pots, in one glimpse. The mic/line inputs settings appear on this screen too.

The analog inputs (1a) go down, the digital inputs (1b) go up to the track cross points (2). The mix faders (3) (carrying the

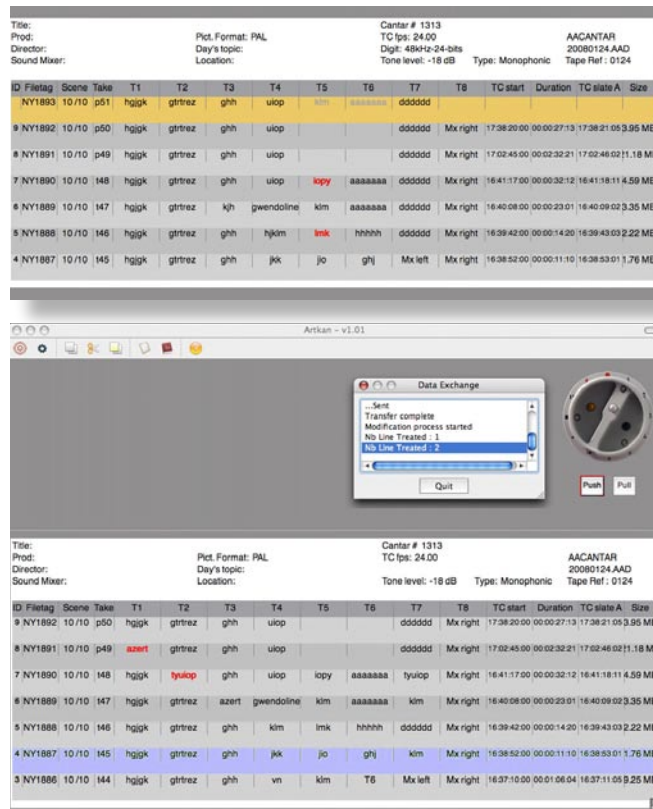


track-names) and the modulometers fly over the tracks going to the pan-pots (4) generating the mixdown input (1c); Armed tracks (5) (deep blue circled) go to the disks and also to the 'LeftCenterRight' *track monitoring* switches (6). Analog and digital inputs go directly to the "input monitoring" switches (7). Both (6) and (7) go to the monitoring crown (8). With Cantar's [MainSelector] set to PPR, clicking on any position (yellow circled) of Tarkan's virtual selector (9) changes Cantar's function to what is clicked (becomes red circled). The Rec&Play

panel (10) is used to select and activate the play-cards.

## 2 'Metadata'

For paradigm consistency, metadata are presented in the same lay-out as the Cantar Sound-Report; they are either immediately written in the open audio files (REC: yellow background, PPR: orange), or stored if the files are closed or inaccessible\*\* (red characters on grey background), waiting to be 'pushed' to the connected Cantar in physical



or virtual BROWSE positions.

Toggling between 'Routes' and 'Metadata' screens is allowed on the positions where the MainSelector becomes dark grey; double click on the selector itself.

## 3 'Operands'

This screen has not yet been released, it displays the AUDIO/TC, TECHSET, SESSION and BACKUP parameters, and handles the 'Save Setup', the off-line\*\* 'Create Setup' and the 'Load Setup' operations.

\* Consult the OS manual, procedure is different between MacOS 10.4 and 10.5.

\*\* Tarkan laptop in standalone mode, disconnected from Cantar (April 2008).

## Connections

If the Cantar motherboard is CM2.6+ (the ID appears under the white sheet in the HDD housing), the CantaRem to Cantar ASCII connection is insured through the Cantar's SubD15 pin-2. Use a 'SubD15 to Lemo8' cable (ref. 594 4090).

*If the motherboard is earlier than CM2.6, the SubD15 pin-2 is not internally connected to the ASCII port. Use a 'SubD15 to Lemo 8+Lemo 5' Y cable (ref. 594 4191), and connect the Lemo 5 to the Cantar timecode-in socket.*

- To gang two CantaRems, use the Fischer4-Lemo8 cable (ref. 594 4092). The Fischer4 plug goes to the first CantaRem, the Lemo8 plug goes to the second one.



- A Lemo 5     ASCII – LTC In/Out
- B USB        PS2 keyboard
- C Fischer 4   PDA power (or CantaRem '1' to '2')
- D Lemo 8      Connection to Cantar (or CantaRem '2' to '1')

- The CantaRem USB socket (max: 80mA, +5V) can't power a PDA; it is made to feed a PS2 keyboard only. But you can use the +12V delivered by the Fischer4 socket, terminate the PDA car-lighter +12V to +5V voltage converter cable with a Fischer4 plug (pin-1: Gnd, pin-4: +12V).

## Sliders' assignment

- Set AUDIO/TC.21 'CantaRemCom' to 'Active'. Press one of the CantaRem [ctrl] keys, 'Assign' appears on the top row of the Cantar rectangular screen. Press and hold a slider key (1 to 8), the slider number is displayed on the middle row.

**note:** if AUDIO/TC.21 is set to 'Inactive' AUDIO/TC.22 - 39 will not be accessible. If you want to modify those settings before hand, set AUDIO/TC.21 to 'Active'.

[jog] or [>] to browse the Cantar faders which successively show on the bottom row: **Unused, Mic-1, Mic-2, Mic-3, Mic-4, Mic-5, Line-1, Line-2, Line-3, Line-4, Line-1&2, Line-3&4, Track-1, Track-2, Track-3, Track-4, Track-5, Track-6, Line-out, Foldback**. The assigned fader is the one displayed while releasing the key.

- The new assignment of a CantaRem slider already linked to another Cantar fader cancels the former link. All Cantar faders are re-enabled as soon as CantaRem is disabled by setting AUDIO/TC.21 'CantaRemCom' to 'Inactive', or by unplugging the cable. Stored assignments are displayed on AUDIO/TC.22 to 31.
- To control several mic input faders from the same actuator, couple them in the usual Cantar way and assign the actuator to the master only. The slaved rotary faders are used for the 'balance'.
- Press a slider key to activate the solo monitoring of the Mic, Line-in or Track fader under its control.
- The 0.6 second latency of Cantar's Line-in faders is more apparent when they are driven by linear actuators which, unlike the Cantar on-board faders, can be swept from 0 to -60dBFS in a wink.
- Put Cantar on STOP to initialize its clock by ASCII from an OriginC.
- Cantar remote: [MainSelector] on PPR, set AUDIO/TC.21 'CantaRemCom' to 'Active'. Press both [ctrl] keys, and press [2]: TEST, [3]: PPR or [4]: REC. When 'CantaRemCom' is set to 'Forced', [1]: STOP is also available.

## Design considerations

- Since Cantar is the only audio recorder featuring a wireless PDA link, there is no need for a 'replica' display nor a built-in keyboard on CantaRem.
- CantaRem's Penny+Gilles faders are feather-smooth, but not as resistant to the elements as Cantar's magnetically driven faders. That is why CantaRem is built with structural transparency, allowing sand and water to freely flow through.
- The precise gain value of each fader is displayed on Cantar's rectangular screen, the actuators' 0 to 9 scale is only a quick positioning aid.

## Functions

- Remotely controls Bluetooth equipped Cantars in TEST, PPR and REC
- Sets input and output routings
- Displays modulometers and fader gains
- Edits scene, take, comments and track-names.

R-can-w runs under Windows Mobile 5, not Mobile 6.

**note:** R-can-p for Palm-OS is no longer maintained, e.g. the remote-record function has not, nor will it be, implemented in this application.

## Installation

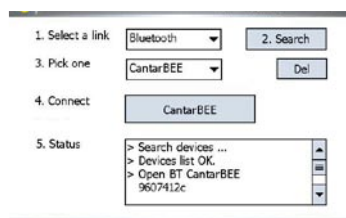
The Win-Mobile5 PDA must feature a VGA screen (640x480), not a QVGA screen (320x240), and an MS Bluetooth stack, not a Broadcom stack, e.g. Qtek 9000, iMATE Jasjar, DELL Axim-51v; HTC X7500 / T-Mobile Ameo.

Download 'rcan-xxx.cab' from the Aaton web site to a PC or Mac and copy it through USB into a folder of the PDA. Then open this folder and execute 'rcan-xxx.cab'.

## Connection to Cantar

**Cantar side** Set TECHSET.17 'Serial Com' to 'Bluetooth'. The 3m range Cantar transmitter is low power (Idle: 0.1 mA, Connecting: 4mA) and may remain active at all times.

**PDA side** Click R.can's icon in the PDA 'programs' screen.



**1. Select a Link:** Bluetooth.

**2. Search:** found Bluetooth devices are shown in the 'Pick one' pulldown menu; click the ID for the Cantar you want to store in the

PDA memory. **3. Pick one:** the list of Cantar IDs in memory is shown; click the desired one.

**4. Connect:** the latest Cantar ID will show at next connection.

**5. Status:** for maintenance engineers.

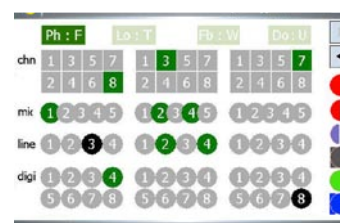
## Working Screens

R.can-w displays the modulometers, prefader and mixer gains, plus the mic-preamp settings. It sets the ins and outs routings, and enters/edits scene, take, track-names and comments.



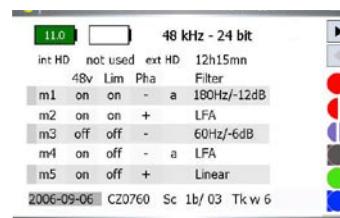
### 1 Inputs grids

track (dis)arming (file rank becomes light grey), M/S status, inputs to tracks routings can be modified in STOP position.



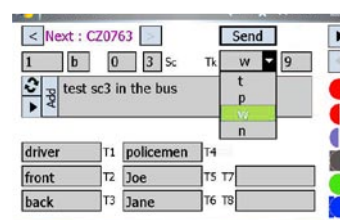
### 2 Outputs maps

recorded signals appear in green; the non-recorded, sent directly to outputs, appear in black. Outputs mapping can be modified in STOP position.



### 3 Physical parameters

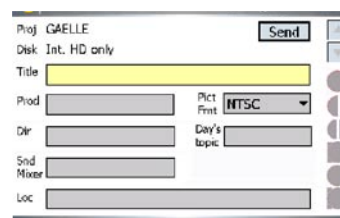
**top:** battery voltage, sample rate and bit-depth, internal/external disk recording time. **middle:** phantom, limiter, phase, high-pass filter in STOP position. Prefader/mixer gains in TEST PPR REC. **bottom:** filetags, scene, take, day and time.



### 4 Metadata editing

Scene, take, comments, and track-names with auto completion, and memorized text insertion, are edited in REC PPR and

BROWSE.



### 5 Sound-Report editing

R.can-w is a great helper to enter and modify the Sound-Report's headers. Several entries per day are allowed. A new .ALE page, a new .CSV page and a new Sound-Report page is opened anytime a header item is changed.

See the complete R.can-w user's instructions on <http://www.aaton.com/products/sound/arcan/index.php>





## OriginC master-clock sets cameras and recorders TC

Start OriginC by pressing the [#] key. Enter *all* of the Prod ID digits, Date and Time. Press [#] to scan through the display. All fields being set, press [\*] to start the clock. To shut-down, press [#] for five seconds until 'Stopped' appears. To ASCII initialize Cantar, cameras or other machines with ASCII (an fps

agnostic protocol), plug the Lemo5 into the LTC socket of the machine, press [#]. OriginC's answer back should be 'good 00.0'.

To ASCII check if a camera clock is within drift limits, connect it to OriginC once in a while, press [#]. OriginC displays 'good' 'fair' 'bad' or 'diff-time', followed by the amount of drift in frame tenths.

To LTC init a machine with SMPTE LTC, simultaneously press [#] [0].

To get or check LTC generated by a IVS-TC, Fostex PD6, etc. or to simply read external timecode, press [\*] [2].

To send continuous LTC to a non-

TC recorder, press [\*] [1], OriginC generates a SMPTE LTC signal to be recorded on an unused audio track.

To select 24, 25, 30fps SMPTE LTC out, press [\*] [4], then [#] to confirm.

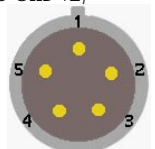
## Technical Specifications

- 1 ppm TCXO  $\pm 1/2$  frame shift after four hours
- Six hour automatic-shutoff
- 150 hours on a Li-Ion 9V battery.
- 180x90x20mm. 375gr.

Order an Aaton L5-XLR3-SCH cable for connection to the recorder's LTC socket.

Lemo 5 plug (ref: PHG OB-305-CLLD42)

- 1-Gnd 2-LTC out
- 3-ASCII in/out
- 4-NC 5-LTC in



## GMT is a 1 ppm low-power LTC generator for SD or HD cameras, audio recorders and digi-slates.

- GMT is momentarily initialized from an ASCII master-clock or another LTC source, whatever its normalized frame-rate.

Permanently installed on a video camera, its (internally adjustable) line-level LTC-out is recorded on an audio track of the camera; this bonds the record-run Video-TC of the camera to the free-run Audio-TC which is also running in the other machines on the set. During image digitization, the NLE will read the Audio-TC and «autosync» images and BWF audio by this common

TC. As opposed to Video-TC radio transmission from camera to recorder, this method works for multicamera shoots.

- GMT is also an emergency master-clock. Turn it 'On' then press the [white] button to initialize its clock from hour 01. The

date generated by a new GMT starts at Y92/M01/D01, it is incremented by one day at each power 'On' followed by a [white] button initialization. The "Year/Month/Day" is stored in a non-volatile memory, resulting in a *never-twice-the-same date* from a given GMT.

## GMT-u (NEW MODEL) remote record

- Whatever the initialization mode, pressing the GMT-u [white] button for more than three seconds makes the LTC output freeze on the last TC value (the four frame-rate LEDs blink). A short push on the [white] button

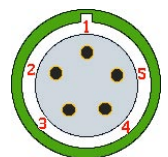
unfreezes the LTC. Sent by wire or radio, this signal stops and starts the Cantar recording (p.18).

## GMT-u Technical Specifications

- 150 gr • 63x123x26mm • 9V battery (150 hours working) • 7 to 18 VDC ext. supply • 6mA consumption • 1ppm clock
- LTC-out: -20 to -60dBu & TTL
- FPS selector: 1 = 24, 2 = 25, 3 = 29.97DF, 4 = 30 ; selected fps LED flashes. 5 = 23.98NDF [24 -0.1%], 6 = 29.97NDF [30 -0.1%]; three LEDs, other than the selected fps, flash.

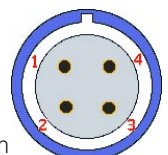
## Lemo 5

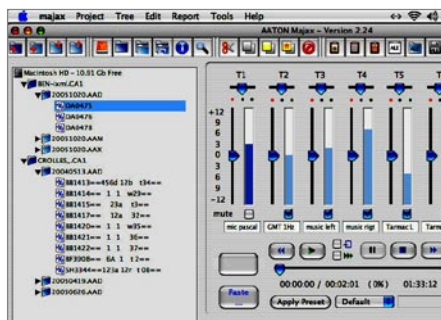
- 1-Gnd 2-LTC in
- 3-ASCII in/out
- 4-LTC out, adj. level
- 5-LTC out, TTL level



## Fischer 4 (GMT-u only)

- 1-Gnd 2-[White] button
  - 3-LTC out adj. 4-Power in
- (Fischer4 plug ref: S102A053130)





## Majax

An Aaton software package for Mac OS and Windows 2K & XP, exclusively devoted to the treatment of Cantar files.

### Plays ten tracks, edits metadata

- Through the laptop built-in audio card, Majax plays ten tracks with  $\pm 1$  2dBu level and pan adjustments, with M/S to L/R decoding and solo listening.
- Majax edits the scene, take, track-names, DayStamp (audio tape reference) and recordist's comments within the BVWF metadata iXML field.
- Clicking the 'Slate' or the 'UM' icon (left of the 'Slate' icon). sends the cursor to the Autoslate or operator entered marks.
- Majax mixes eight monophonic tracks into two, and interleaves them into polyphonic files.

### Generates frame-accurate Sound-Reports

Gathering the iXML metadata generated by Cantar and the operator, Majax builds a Sound-Report with your edited metadata entries. It is saved in PDF format to be printed and mailed to the Post Production team, and in Avid list format (.ALE) which can be opened by any spreadsheet application.

### Q: How to get audio out of a Mac-Intel.

A: Go to Root disk -> Library -> Preferences in which you delete the file 'com.AATON.Majax.plist'.

If you re-open the menu in which you see 'Built-in Mic', immediately get out by 'Cancel'! Clicking [ok] would again corrupt the clean 'com.AATON.Majax.plist' that Majax just rebuilt after the deletion of the corrupted one.

### Q: How to edit DVD-RAM discs with a Mac?

A: Apple is not DVD-RAM friendly! First install SoftArch 'WriteUDF' <http://www.softarch.com> then if you use a laptop equipped with an 'E' (economic) SuperDrive (sic), you must either discard it and install a genuine Matsushita UJ 875, or connect a standalone DVD-RAM burner with patchburn <http://www.patchburn.de> or use the (TECHSET.01 'Unmount'-ed) Cantar internal burner.

## IndawPass

Tell your Post Production manager that Aaton's IndawPass is the **fastest Tape-to-Tape and Audio/Video Sync** machine in the industry when it comes to syncing audio files to DPX, HD and SD images.

### FPS agnostic

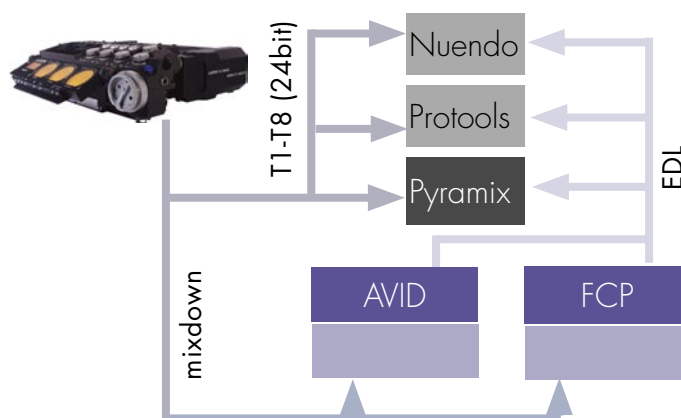
IndawPass solves all the problems Post Production facilities may encounter in the maze of audio-video-film speeds and standards.

### Transfer-list cleaner

IndawPass also rejuvenates the ALE transfer lists sent to the Avid with better Keycode matching than the telecine originals.

## The PostChain

Read 'The PostChain' <http://www.aaton.com/files/cantar-post-chain-22.pdf>

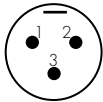


## Titan-3

For autoconforming with Titan-3 **FlashConform** and FixSync using the Cantar filetags, get the cantar.tsc rules from Synchro Arts <http://www.synchroarts.com> or send an email to [aaton-support@aaton.com](mailto:aaton-support@aaton.com). By their very nature the Aaton filetags eliminate all TC overlaps, and this is a huge advantage over all other references!

**note:** Titan-3 does generate sample accurate audio conformation lists, provided the **FixSync** process is performed immediately after the EDL driven FlashConform operations.

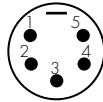


**Connectors****Mic-in XLR3(F)**

Symetrical, transformer (0dBu/+24dBu w/ pad)  
Mic 1, Mic 2, Mic 5 on XLR 3:  
1 = Gnd 2 = Hot 3 = Cold

**Mic-in XLR5(F)**

Symetrical, transformer (0dBu/+24dBu w/ pad)  
Mic 3 (Left or M): 1 = Gnd 2 = Hot 3 = Cold  
Mic 4 (Right or S): 1 = Gnd 4 = Hot 5 = Cold

**Line-in XLR5(F)**

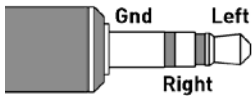
Assymetrical (4.4k ohm, +10dBu)  
Line-in 1 (3): 1 = Gnd 2 = Hot 3 = Cold  
Line-in 2 (4): 1 = Gnd 4 = Hot 5 = Cold

**Line-out XLR5(M)**

Symetrical, -10dBu out @ -18dBFS on track.  
*note: HD camera Line-in practice is -20dBu, not 0dBu.*  
Line-out 1: (stereo Left)  
1 = Gnd, 2 = Hot, 3 = Cold  
Line-out 2: (stereo Right)  
1 = Gnd, 4 = Hot, 5 = Cold

**Foldback TA-3(M) Mini-XLR3**

1 = Gnd, 2 = Left, 3 = Right  
(3.5mm Mini-jack socket on earlier Cantars)

**Phones 1/4" jack**

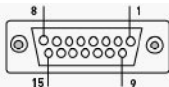
8 ohm speakers up to 2Vrms

**Timecode-in/out LEMO 5(F)**

1 = Gnd 2 = LTC-In 3 = ASCII 4 = nc  
5 = LTC-Out

**Power XLR4(M) (max: +16.6V)**

1 = Gnd 3 = Li-Ion\* 4 = NiMh or Li-Ion w/diode  
\*Cantars over # 268 directly receive Aaton R-Cell Li-Ion battery power through pin-3.

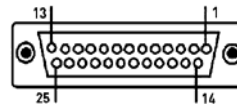
**Remote & Sync SubD 15**

socket as seen from the outside

April 2006

1	2	3	4	5	6	7	8
GND	ASCII	LTC OUT	WORDCLK	RESERVED	RESERVED	RX	TX
9	10	11	12	13	14	15	
BATTERY+	LTC IN	REC TALLY	RESERVED	RESERVED	GND	GND	

2 ASCII-in with motherboard CM2.6+  
3 LTC-Gen if 'On' in 'AUDIO/TC.16'  
4 Wordclock Cantar-X2 only  
9 Batt+ Out 13±3V, polyfused @250mA  
11 Record Tally closure to ground (p.22)

**AES-in/out SubD25**

socket seen from the outside.  
Tascam TD88 standard

AES inputs				AES outputs			
CHANNEL PAIR	HOT +	COLD -	GND	CHANNEL PAIR	HOT +	COLD -	GND
1-2	24	12	25	1-2	18	6	19
3-4	10	23	11	3-4	4	17	5
5-6	21	9	22	5-6	15	3	16
7-8	7	20	8	7-8	1	14	2

**Accessories****Line-out Booster +12**

Two 12dB gain transformers make the Line-out deliver 0dBu at -18dBFS track level (ref. 20-270-50).

Line-out Booster +12

USB-PS2 to SubD 15

**USB-PS2 to SubD 15**

Converter featuring a regulator (max 60mA, +5V), and an RS232 translator for PS2 keyboards w/ USB-like plug (ref. 59-681-91).

Only use a QWERTY US/English PS2 compliant keyboard such as the Cherry G84-4100 PTM EU.

[http://www.cherry.de/english/advanced-line/advanced\\_g84-4100.htm](http://www.cherry.de/english/advanced-line/advanced_g84-4100.htm)

**8to8 bridge**

(non SL1 equipped Cantar-X1)

Eight 26dBu /10k ohm transformer isolated balanced line inputs to Cantar mic & line inputs. See tutorials on

<http://www.soft.aaton.com/swcantar>

**Internal DVD-RAM burner**

Note the position of the shield to be installed on a c (p.41).

